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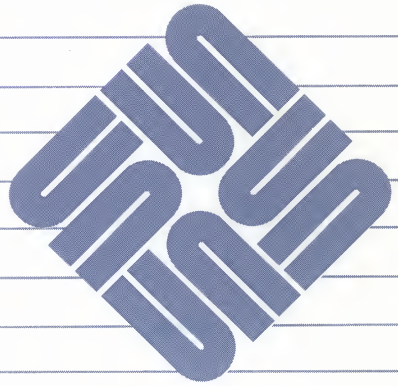
Sun 56-Inch Data Center Cabinet and Data Center Expansion Cabinet Installation Manual



Part No: 800-3242-10
Revision A of 26 September 1989

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Sun 56-Inch Data Center Cabinet and Data Center Expansion Cabinet Installation Manual

Sun Microsystems, Inc. • 2550 Garcia Avenue • Mountain View, CA 94043 • 415-960-1300

Part No: 800-3242-10
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CAUTION

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Contents

Tables

Figures

Preface

The purpose of this manual is to provide you with instructions for installing a 56-Inch Data Center Cabinet and 56-Inch Data Center Expansion Cabinet.

Summary of Contents

The contents of this manual are organized in this way:

Chapter 1

This chapter provides an overview of cabinet features, important site preparation requirements, and directions for unpacking and inspecting the system.

Chapter 2

This chapter provides basic Data Center Cabinet installation procedures, including:

- an overview of cabinet power safety precautions
- instructions on positioning the cabinet as well as locating and adjusting casters and levels
- an overview of cable routing procedures
- an explanation of how to unpack and connect the AC power cord
- instructions on powering up the system as well as reducing the load on the AC power line

Chapter 3

This chapter provides information for removing all external panels, and steps necessary for accessing peripheral areas.

You will find a *Reader Comment Sheet* at the back of this document. Please fill it out and return the sheet to us; it will help us to maintain the accuracy and usefulness of this document. Your comments are greatly appreciated.

1

Introduction

1

Introduction

This chapter provides the following information:

- Overview of cabinet features and options
- Important site preparation requirements
- Directions on inspecting the system
- Directions on shipping or storing the system

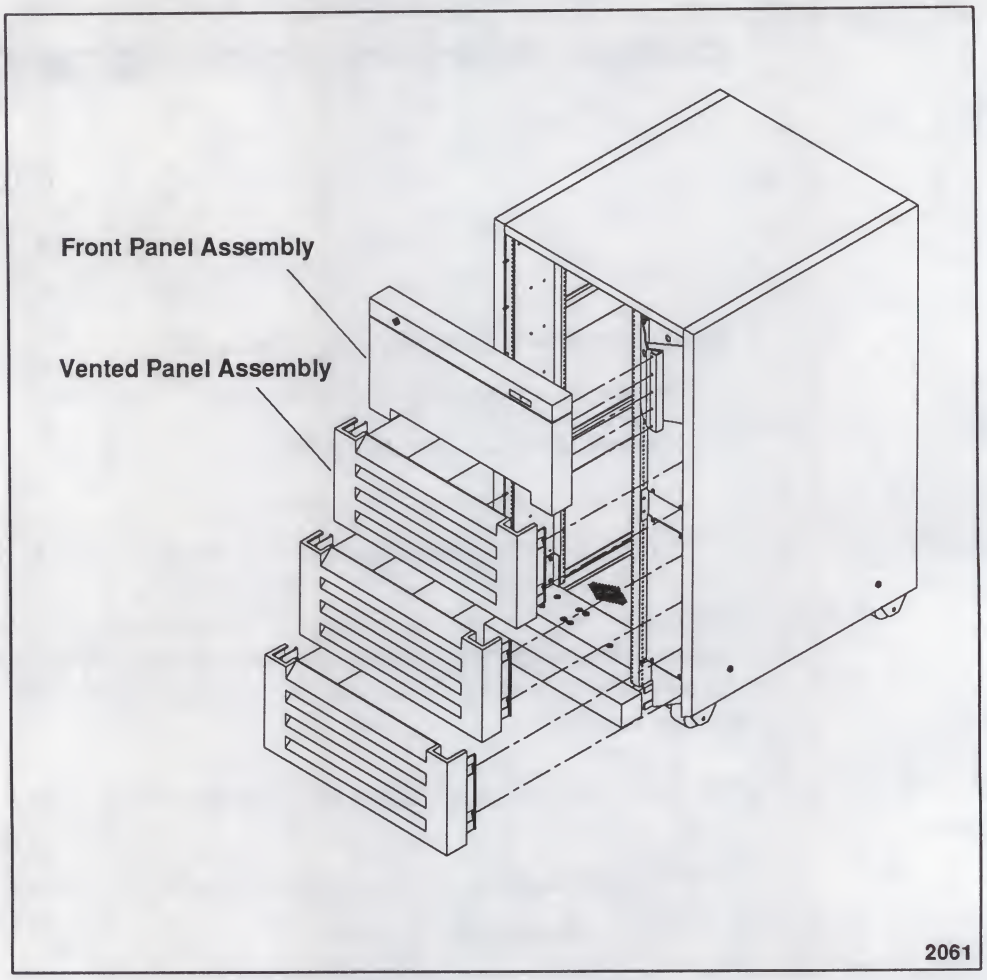
NOTE *The Sun 56-Inch Data Center Cabinet is shipped on a pallet and in some instances, may be professionally unpacked at your company. If you are unpacking the cabinet yourself, follow the directions provided on the outside of the packing materials.*

1.1. Minimum Configuration

The 56-Inch Data Center Cabinet has a minimum system configuration as follows:

- 56-Inch Data Center Cabinet Chassis Trim (refer to figure 1-1).
- 16-slot VMEbus Logic Enclosure
- CPU Board with On-board Memory
- Memory Board
- Either one 150-Mbyte 1/4-Inch Tape Drive or one Front-Load 1/2-Inch Tape Drive
- SunOS software

Figure 1-1 *56-Inch Data Center Cabinet*



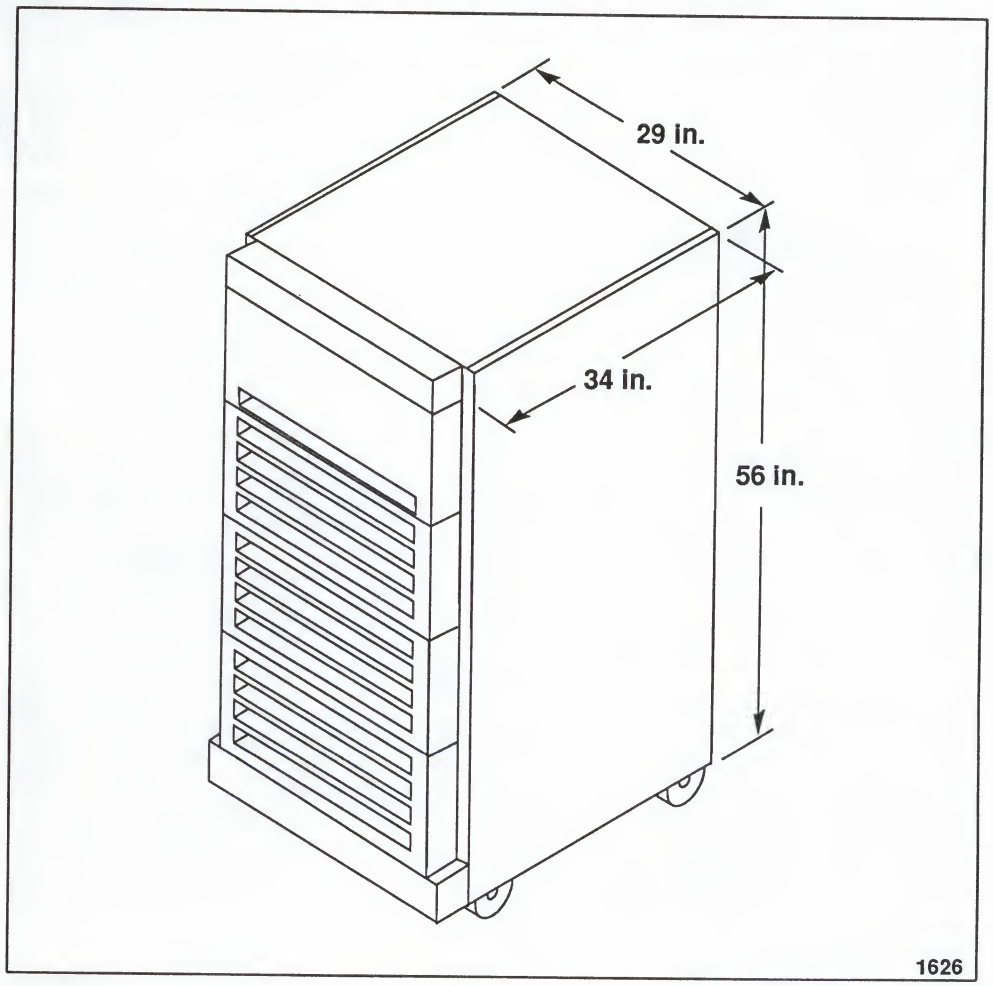
1.2. Physical Characteristics

The 56-Inch Data Center Cabinet accommodates a standard 9U VMEbus 16-slot logic enclosure (card cage subassembly). The Sun 56-Inch Data Center accommodates rack-mountable peripherals and similar subsystems. The cabinet dimensions, listed below, are shown in figure 1-2.

- Internal dimensions conform to EIA RS-310C standard (RETMA) for 19-inch racks. Universal mounting holes are used with 10-32UNF tapped holes in all locations. The nominal rack opening is 17.875 inches.
- A vertical panel opening of 28 Rack Unit (RU) minimum is provided to accommodate eight 3 RU subsystems plus an additional 4 RU. (One RU is equal to 1.75 inches.)
- The overall height of the cabinet with cosmetic panels is a maximum of 56 inches.

- Extra width is provided on the side of the cabinet (outboard of the vertical mounting rail) for cabling, additional components, etc. This extra width is sufficient to accomodate a 3RU, (5.25-inch), subsystem on end.
- The depth of the cabinet, with panels removed, is less than 34 inches to facilitate moving cabinets through standard 36-inch doorways.
- The cabinet structure and casters are designed for a 1200-pound static load.

Figure 1-2 *Sun 56-Inch Data Center Cabinet Dimensions*



1.3. Options

The 56-Inch Data Center Cabinet may ship with a number of different options, depending on what system you ordered. These options may include:

- Asynchronous Line Multiplexer-2s (ALMs) Board(s)
- Tape Drives
- Disk Drives
- Accessory Boards (for disks, Ethernet, memory, monitors)

- Color or Monochrome Monitors
- 56-Inch Data Center Expansion Cabinet (refer to figures 1-3 and 1-4).

Refer to the *System Overview* manual which specifies the options supported in your 56-Inch Data Center Cabinet. This manual contains only generic installation instructions, i.e., those required for accessing the deviceareas. For detailed installation instructions on monitors, modems, and printers, refer to the CPU board installation documentation shipped with your system. For instructions on setting up SCSI peripherals designed for use with the Sun 56-Inch Data Center Cabinet, refer to the appropriate device installation manual.

Figure 1-3 *56-Inch Data Center Expansion Cabinet*

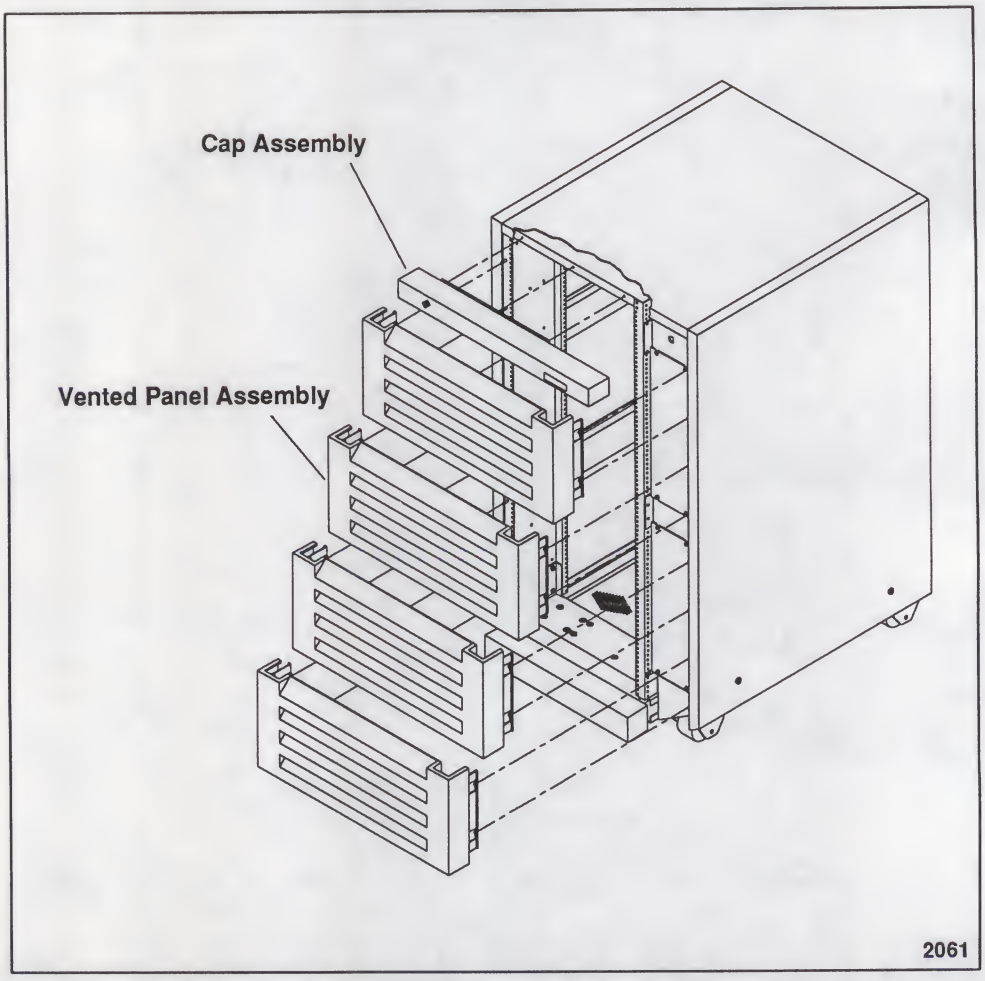
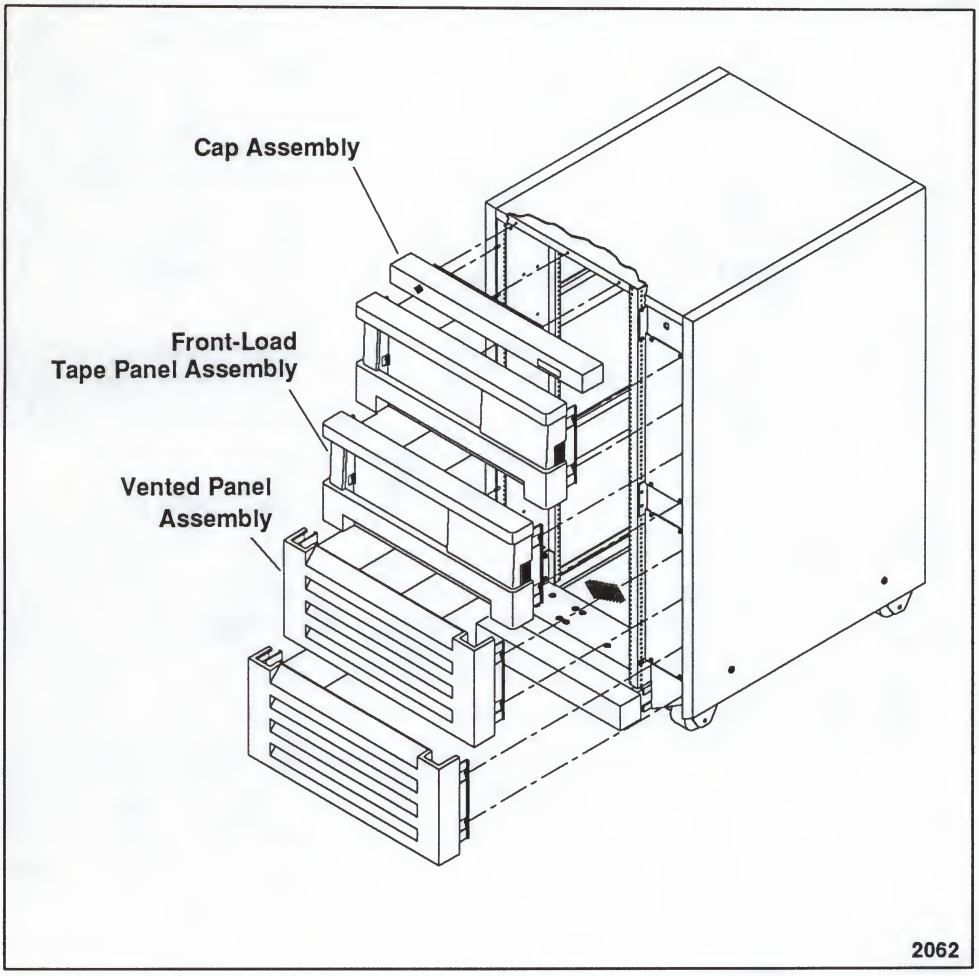


Figure 1-4 *56-Inch Data Center Expansion Cabinet with Front-Load Tapes*



1.4. Important Site Preparation Requirements

Sun Microsystems recommends installing the Sun 56-Inch Data Center Cabinet in a computer room environment. Computer room installation provides security access to computers and stored information, and allows control of environmental factors such as temperature, humidity, airborne dust, and so forth. Computer room installation also protects the equipment from fires, floods, and any other dangers originating in the building.

NOTE *For a complete description of all aspects of site preparation, including site selection (floorspace, location, safety, security), and environmental requirements, (air conditioning, heating, filtering and vibration), contact your local sales office to order the* ***Sun Site Preparation Guide for X90 Systems*** *(P/N 800-3270).*

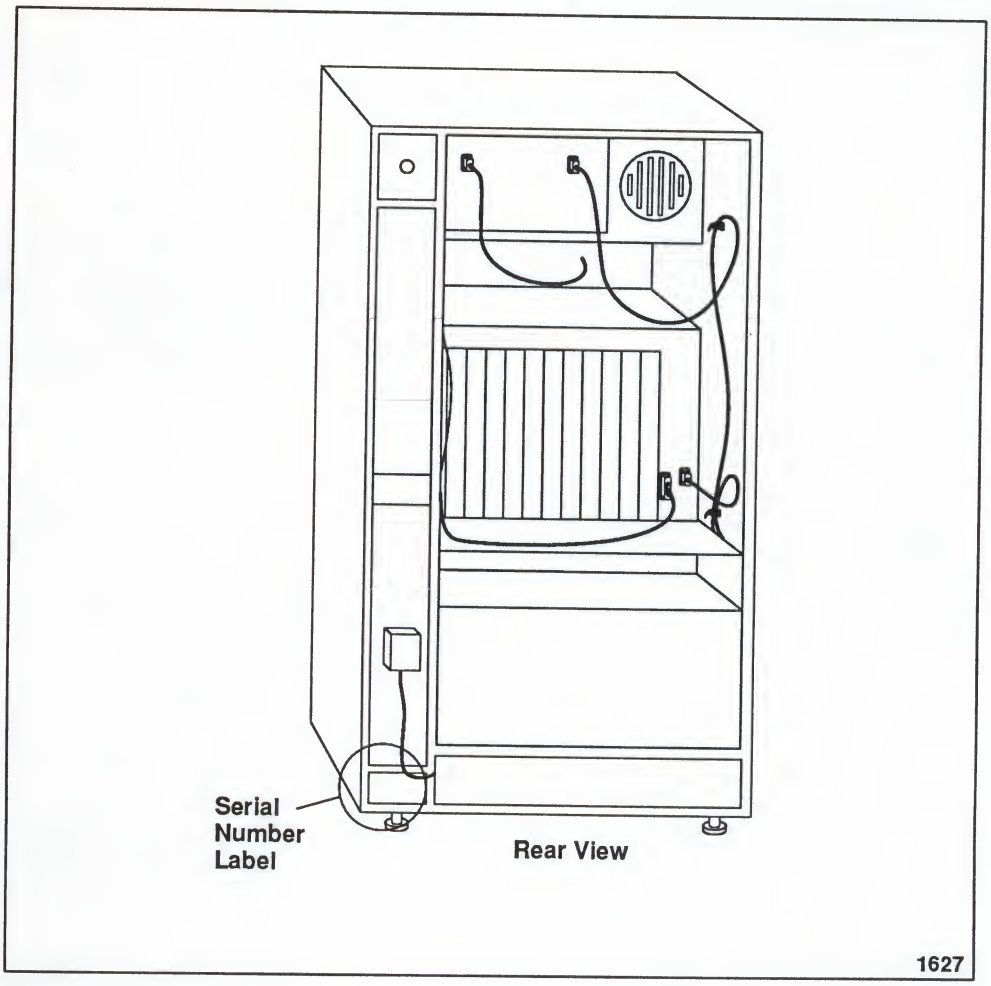
1.5. Inspecting the System

Select an area with ample room for the unpacking crew to move about while unpacking the system. Place protective pads or cushioning down to prevent scratching or damage to cosmetic surfaces. It is recommended that at least three people lift, unpack, and set up the system.

To inspect the equipment, follow the steps listed below.

1. Immediately inspect all shipping containers for evidence of physical damage. If a shipping carton is damaged, request that the carrier's agent be present when the carton is opened. Keep all of the contents and packing material for the agent's inspection.
2. Verify that the components you received match the shipping list.
3. Check the electrical ratings label on the serial number label (located on the rear panel at the lower lefthand corner of the cabinet as shown in figure 1-5) to make sure it matches your AC input voltage. You received either the US domestic cabinet (230-volt operation) or the European cabinet (240-volt operation).

Figure 1-5 *Checking the Cabinet Voltage Rating on the Serial Number Label*



Shipping or Storing the System

Be sure to use the original shipping containers and packing materials provided when preparing the cabinet for shipment or storage. Follow (in reverse) the graphic unpacking instructions which are attached to or printed on the panels of each of the shipping containers.

2

Basic 56-Inch Data Center Cabinet Installation

2

Basic 56-Inch Data Center Cabinet Installation

This chapter provides the following information:

- An overview of cabinet power safety precautions
- Instructions on positioning the cabinet as well as locating and adjusting casters and levelers
- An overview of cable routing procedures
- An explanation of how to unpack and connect the AC power cord
- Instructions on powering up the system as well as reducing the load on the AC power line

2.1. Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- **Do not connect any cables until instructed to do so.**
- **Ensure that the voltage and frequency of the power outlet you will use matches the electrical rating labels on the cabinet and the video monitor.**
- **Only use properly-grounded power outlets as described in this chapter and the *Sun Site Preparation Guide for X90 Systems*, P/N 800-3270, available through your local sales office.**
- **Refer servicing of the cabinet and its components to qualified personnel.**

2.2. Positioning the Sun 56-Inch Data Center Cabinet

When positioning the cabinet, make sure that it is positioned at least **three feet** from the wall. If an ALM-2 option is installed, leave at least **an additional three feet** access space on the right side of the cabinet.

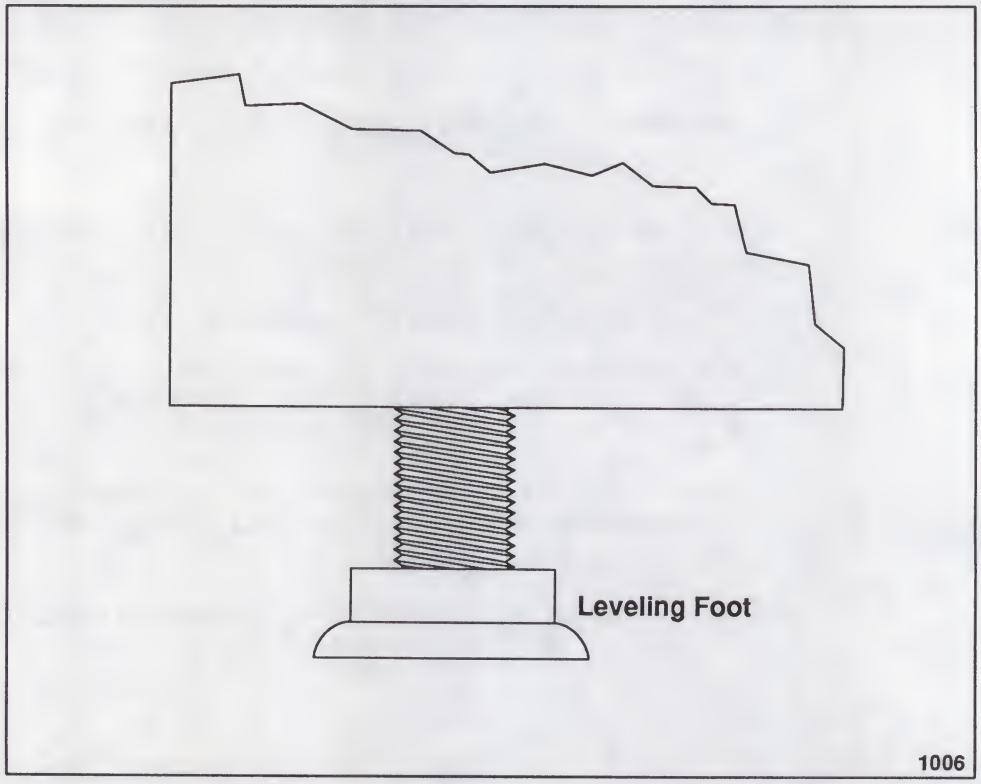
NOTE *For mobility of the cabinet it is recommended that it be placed two to three inches from the wall on both the left and right sides.*

When the enclosure is level, all four feet will be securely on the floor, the disk drive will be parallel to the floor, and you will not be able to rock the cabinet either back and forth or from side to side.

Adjusting the Leveler Feet

1. There are four leveler feet which are threaded into each corner of the cabinet base. The leveler feet are adjusted by screwing the four feet either up or down until the cabinet is level. Adjust the feet until they all come in contact with the floor. Refer to figure 2-1.

Figure 2-1 *Cabinet Leveler Foot*

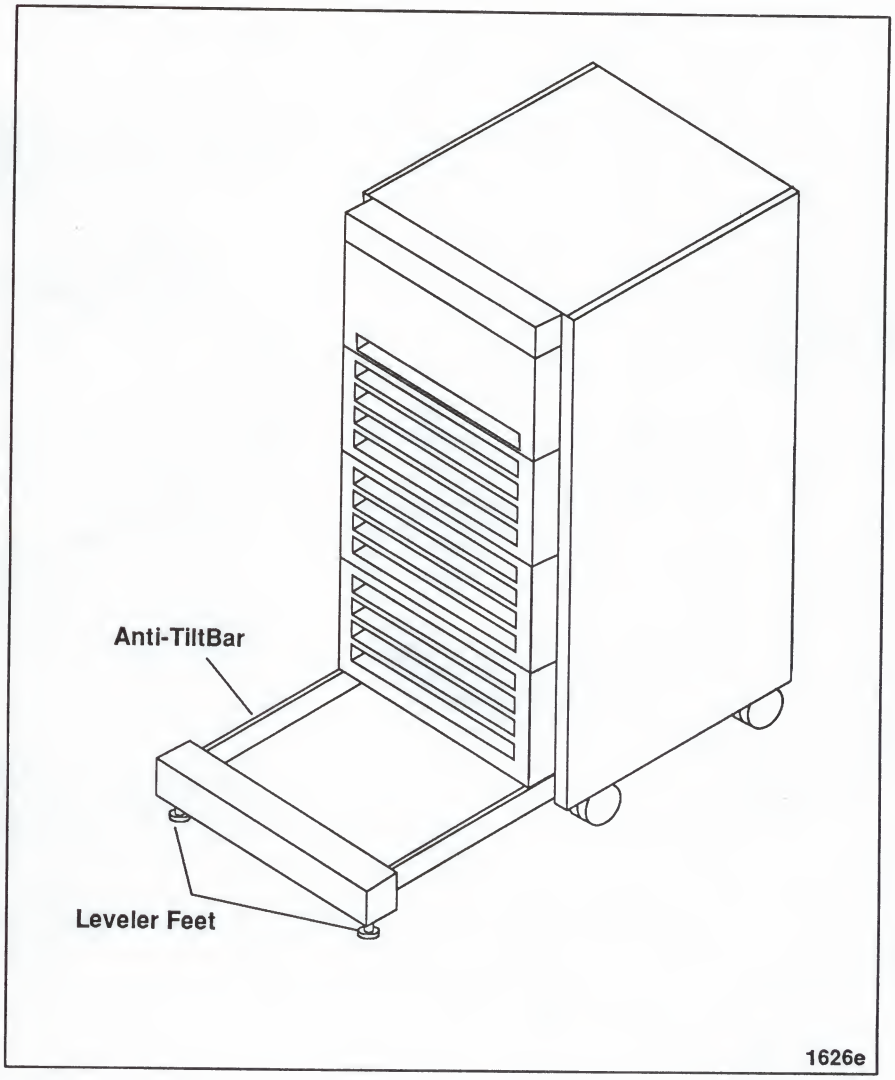


2. An anti-tilt bar, shown in figure 2-2, is installed at the bottom front of the cabinet. The anti-tilt bar prevents tipping of the cabinet when the disk drive chassis or the tape drive mechanism is pulled out from the cabinet. The anti-tilt bar has two leveling feet at the outer end. Unscrew each foot until it is close to the floor, and then pull the anti-tilt bar out to full extension. Adjust the feet until they touch the floor.

3. Adjust the two leveler feet on the anti-tilt bar until they are **one-eighth to one-fourth of an inch** from the ground.

CAUTION **Do not over-tighten the leveling feet. The feet should not lift the cabinet front when properly adjusted. The anti-tilt bar must be extended before attempting to service disks on slides or the Front-Load ½-Inch Tape Drive.**

Figure 2-2 *Anti-Tilt Bar*



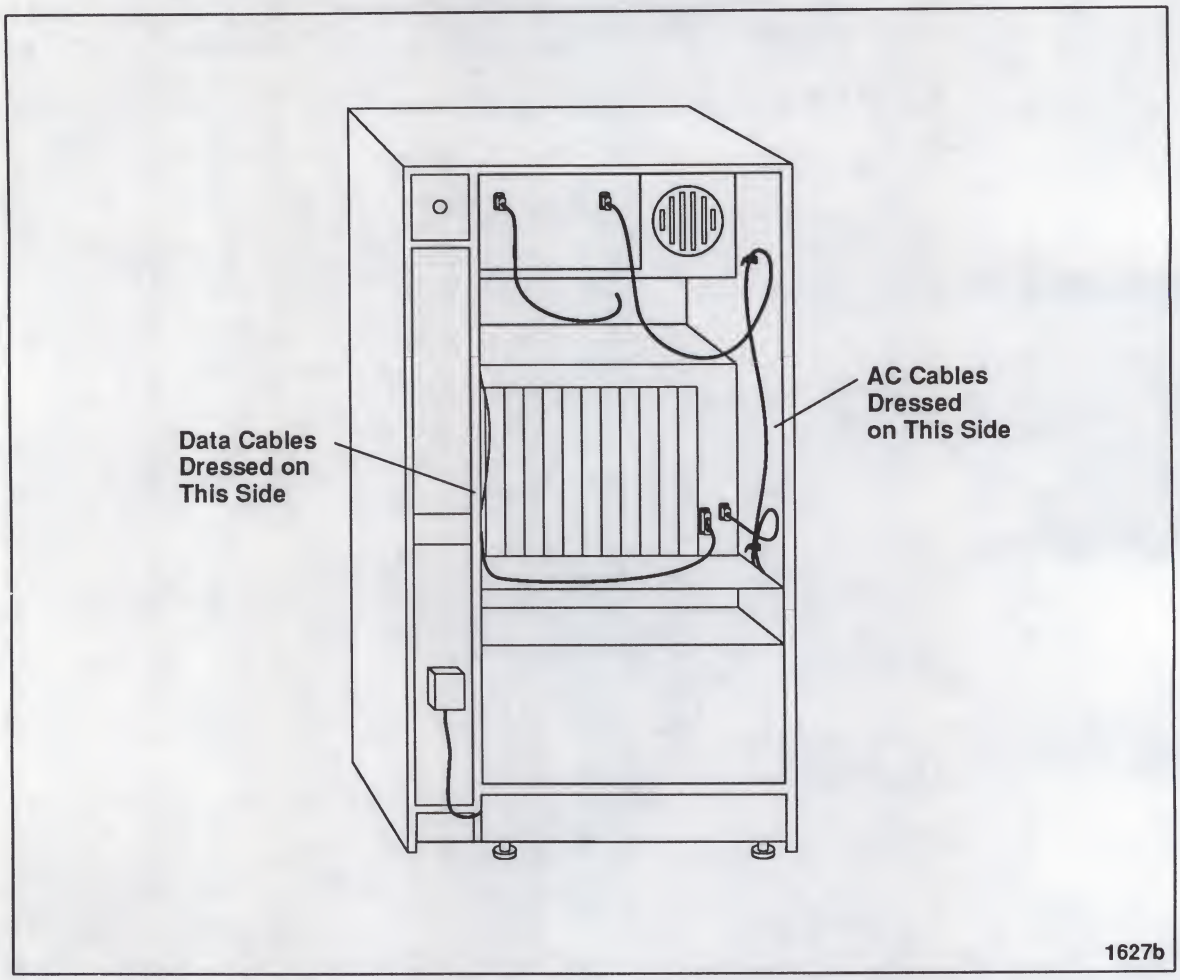
2.3. Overview of Cable Routing

The Sun 56-Inch Data Center Cabinet ships with snap-in cable ties and reusable tie wraps.

All ALM-2 and video monitor cables should be routed down the left side of the cabinet as shown in figure 2-3. The kick panel at the base of the vented rear panel can be removed to facilitate cable routing. Refer to Chapter 2 if you need instructions on removing the kick panel.

Cable routing, as well as instructions for making keyboard, monitor, and remote terminal connections, is included in Appendix B.

Figure 2-3 *Cable Routing Conventions*



2.4. Unpacking and Routing the Power Cord

There are two ways to unpack the AC power cord from the cabinet:

- Remove the kick panel at the bottom of the vented rear panel
- Remove the vented rear panel

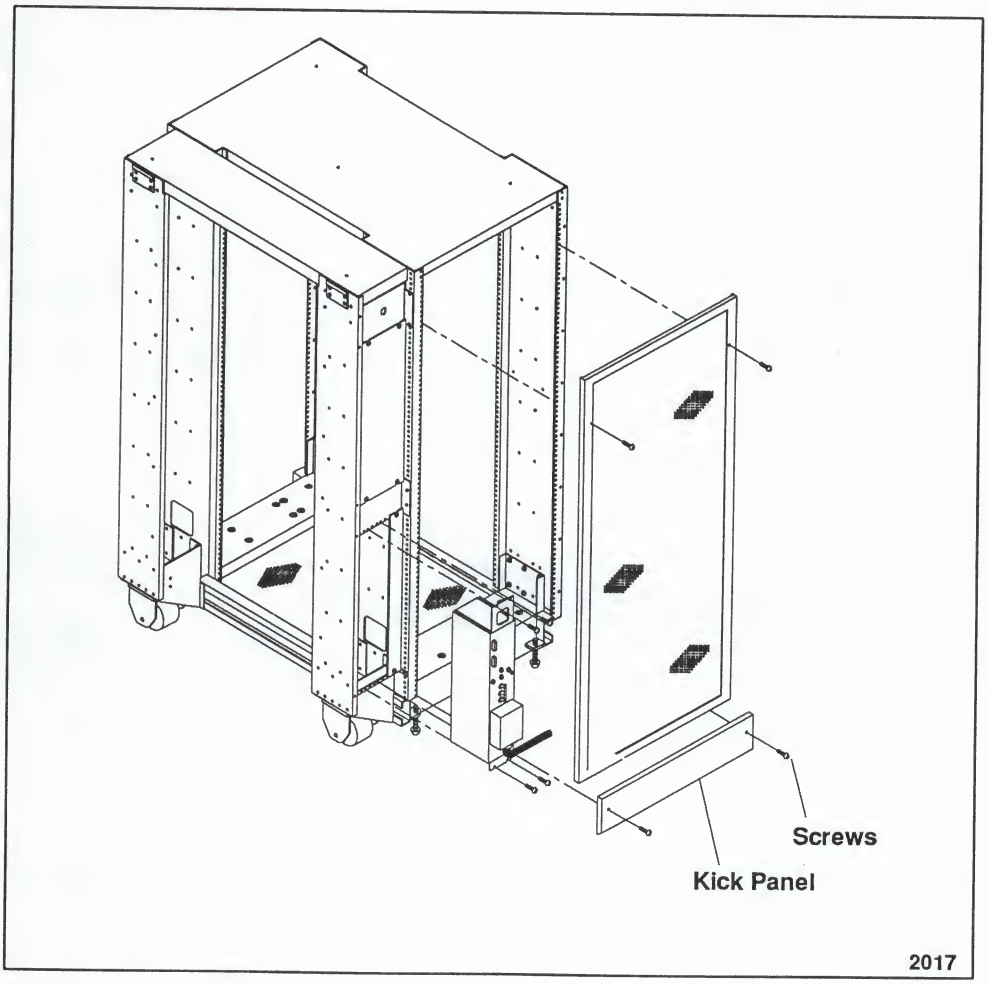
Routing the AC Power Cord Through the Kick Panel Area

NOTE *This is the simplest way to remove the AC cord if you do not have to open the rear of the cabinet to install options.*

To unpack and properly route the AC power cord through the kick panel area,

1. Gain access to the rear of the cabinet.
2. Use a Phillips screwdriver to remove the two screws securing the kick panel at the bottom of the vented rear panel. Refer to figure 2-4.
3. Locate the 15-foot power cord in the base of the unit. It is a thick, black cord, approximately three-quarters-of-an-inch in diameter, tie-wrapped to the inside RETMA rail for shipment.

Figure 2-4 *Removing the Kick Panel for Power Cord Routing*



4. Cut the tie-wrap holding the 15-foot power cord to the RETMA rail, and unroll the cord.

5. Route the power cord through the lower rear panel area of the cabinet.
6. Replace the kick panel or store it away for possible future use.

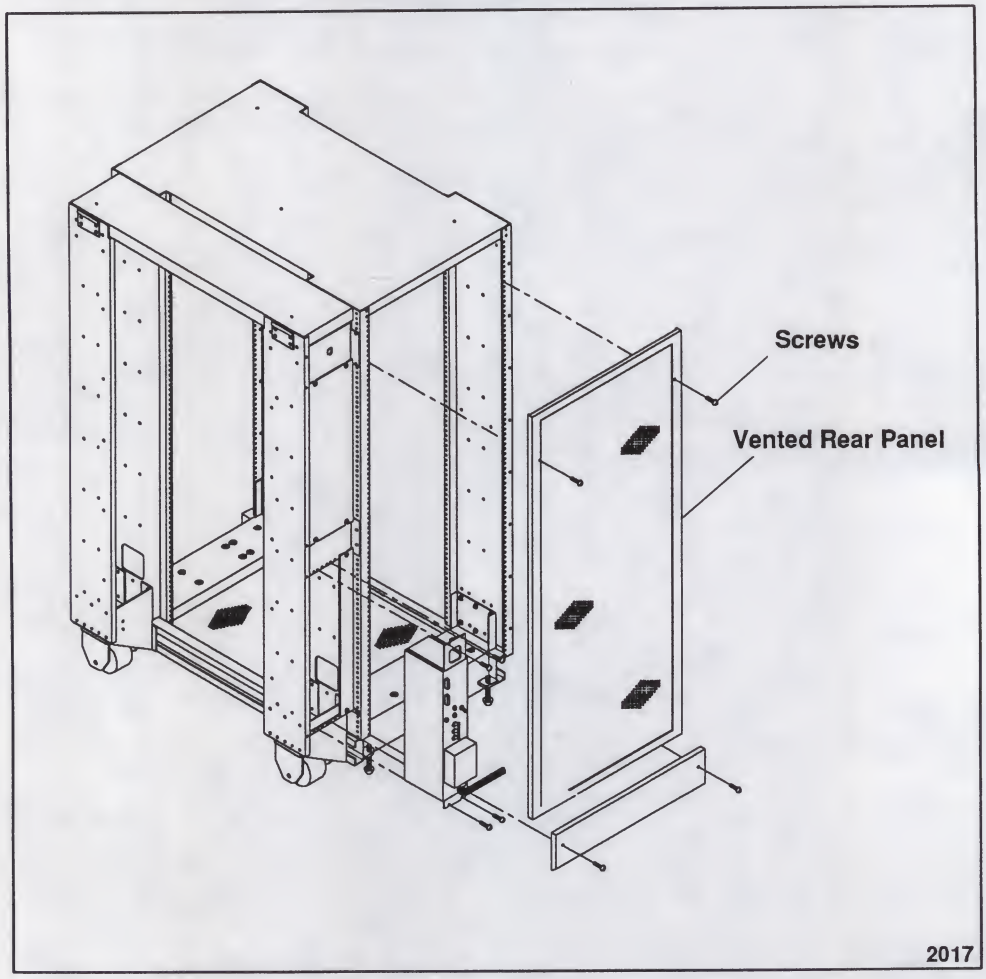
CAUTION **Do not connect the power cord to the outlet yet! Refer to the section, "Connecting the Power Cord" for instructions.**

Routing the AC Power Cord Through the Vented Rear Panel Area

To unpack and properly route the AC power cord by removing the rear panel,

1. Gain access to the rear of the cabinet.
2. Use a screwdriver to release the two screws securing the vented rear panel to the cabinet. Refer to figure 2-5.

Figure 2-5 *Removing the Vented Rear Panel*



3. Locate the 15-foot power cord at the base of the unit. It is a thick black cord, approximately three-quarters-of-an-inch in diameter. It is tie-wrapped to the RETMA rail for shipment.
4. Cut the tie-wrap holding the 15-foot power cord to the RETMA rail, and unroll the cord.

5. Route the power cord out through the lower rear panel area of the unit.
6. Replace the vented rear panel.

CAUTION **Do not connect the power cord to the outlet yet! Refer to the section, "Connecting the Power Cord" below for instructions.**

Connecting the Power Cord

Follow the steps listed below to connect the power cord correctly.

NOTE *The power cord must be connected to a dedicated 30-amp circuit.*

CAUTION **Do not make mechanical or electrical modifications to the cabinet. Sun Microsystems is not responsible for regulatory compliance of modified cabinets.**

All power cords for components in the cabinet must be plugged into the power sequencer; they may be routed outside the cabinet. Additional power sequencers may not be added to the cabinet.

The 56-Inch Data Center Cabinet has high leakage current to ground. The following instructions must be strictly observed in order to reduce the risk of electric shock.

1. The following plug types are provided on the power cord:
   a. NEMA L6-30P for 200-240V North American operation.
   b. 32A, single-phase, IEC 309 connector for 220-240V European operation.

   If an appropriate mating receptacle is not available in your country, the plug may be removed from the cord. The cord may then be permanently connected to a dedicated branch circuit by a qualified electrician. Check local electrical codes for proper installation requirements.
2. An insulated grounding conductor that is identical in size, insulation material, and thickness to the neutral grounded and hot ungrounded branch-circuit supply conductors, (except that it is green with or without one or more yellow stripes), is to be installed as part of the circuit that supplies the unit or system.
3. The grounding conductor described in item 2 above is to be grounded to earth at the service equipment, or, if supplied by a separately derived system, at the supply transformer or motor-generator set.
4. The attachment-plug receptacles in the vicinity of the unit are all to be of a grounding type, and the grounding conductors serving these receptacles are to be connected to earth ground at the service equipment.

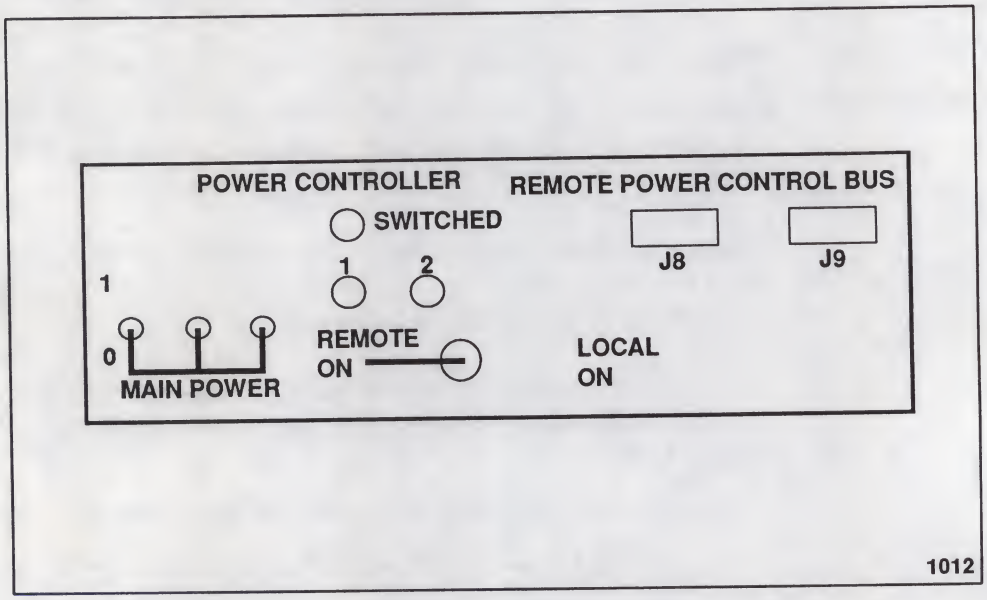
2.5. Powering Up the System

To connect the system to AC line power,

1. Turn the key switch, located at the front of the cabinet, to the vertical (OFF) position. Refer to figure 2-6.

NOTE *The keys for this switch will either be packed in the base box or attached to this manual.*

Figure 2-6 *Control Panel*



2. Set the LOCAL/REMOTE switch to the REMOTE ON position. Then, switch on the MAIN POWER circuit breaker.
3. Turn the key switch, located at the front of the cabinet, to the horizontal (ON) position. If you do not hear the fans spinning, turn off the keyswitch and investigate the cause.

NOTE *As shown in figures 2-7 and 2-8, the system will not power on until 20 seconds after the key switch is turned. The first and third disk drives will spin up first.*

The Sun cabinet is equipped with a blower box assembly (located under the logic enclosure assembly) that provides internal air circulation. This blower box assembly is connected to the power sequencer and turns on when the keyswitch is rotated to the "1" position.

4. The cabinet is now powered up.

Power Requirements

Table 2-1 gives the maximum operating voltage and frequency ranges for the system. For individual component requirements, refer to the *Sun Site Preparation Guide for X90 Systems, P/N 800-3270*.

Table 2-1 *Power Requirements*

Configuration	*Nominal AC Input Voltage Range*	*Operating Range*	*Operating Frequency Range*
Domestic (V3 Option)	200-240 VAC	180-264 VAC	47-63 Hz
European (V4 Option)	220-240 VAC	180-264 VAC	47-63 Hz

Table 2-2 shows the current requirements at nominal line voltage for a cabinet in maximum configuration.

Table 2-2 *Current Requirements*

Configuration	*Nominal AC Input Voltage Range*	*Maximum Current Requirement*	*Maximum Current Per Controller Outlet*
Domestic (V3 Option)	200-240 VAC	24 A	10 A
European (V4 Option)	220-240 VAC	24 A	10 A

2.6. Reducing Power-Up Load to the System

In order to reduce the power-up load on the AC line cord, a power sequencer has been designed into the Sun 56-Inch Data Center Cabinet. The controller performs two functions:

- it powers the components up in a controlled sequence twenty-second delay for cabinet options between switched 1 and switched 2
- it provides line transient voltage protection

Figures 2-7 and 2-8 show the correct arrangement of equipment connections to the power sequencers for 56-Inch Data Center Cabinets.

2.7. Installing a 56-Inch Data Center Expansion Cabinet

If you are installing a 56-Inch Data Center Expansion Cabinet, you must ensure that a ground strap is attached to the power sequencers on both the 56-Inch Data Center Cabinet and 56-Inch Data Center Expansion Cabinet, as shown in figure 2-9. The ground strap reduces high-frequency noise between the Data Center Cabinet and Expansion Cabinet. If you are installing a second Expansion Cabinet, you must daisychain the strap between the two cabinets.

Figure 2-7 *Connections to the 200-240V Domestic Power Sequencer*

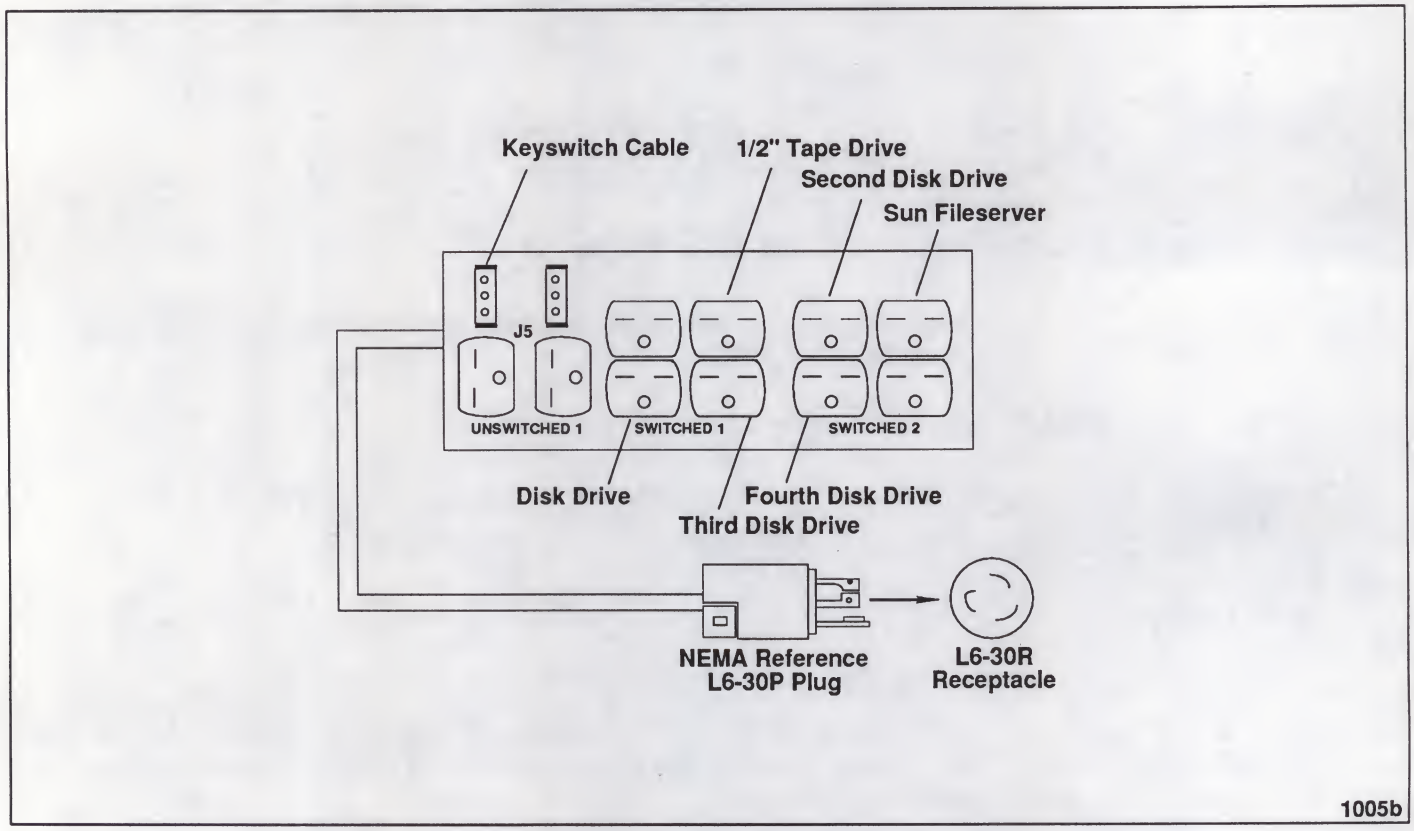


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Figure 2-8 *Connections to the 200-240V European Power Sequencer*

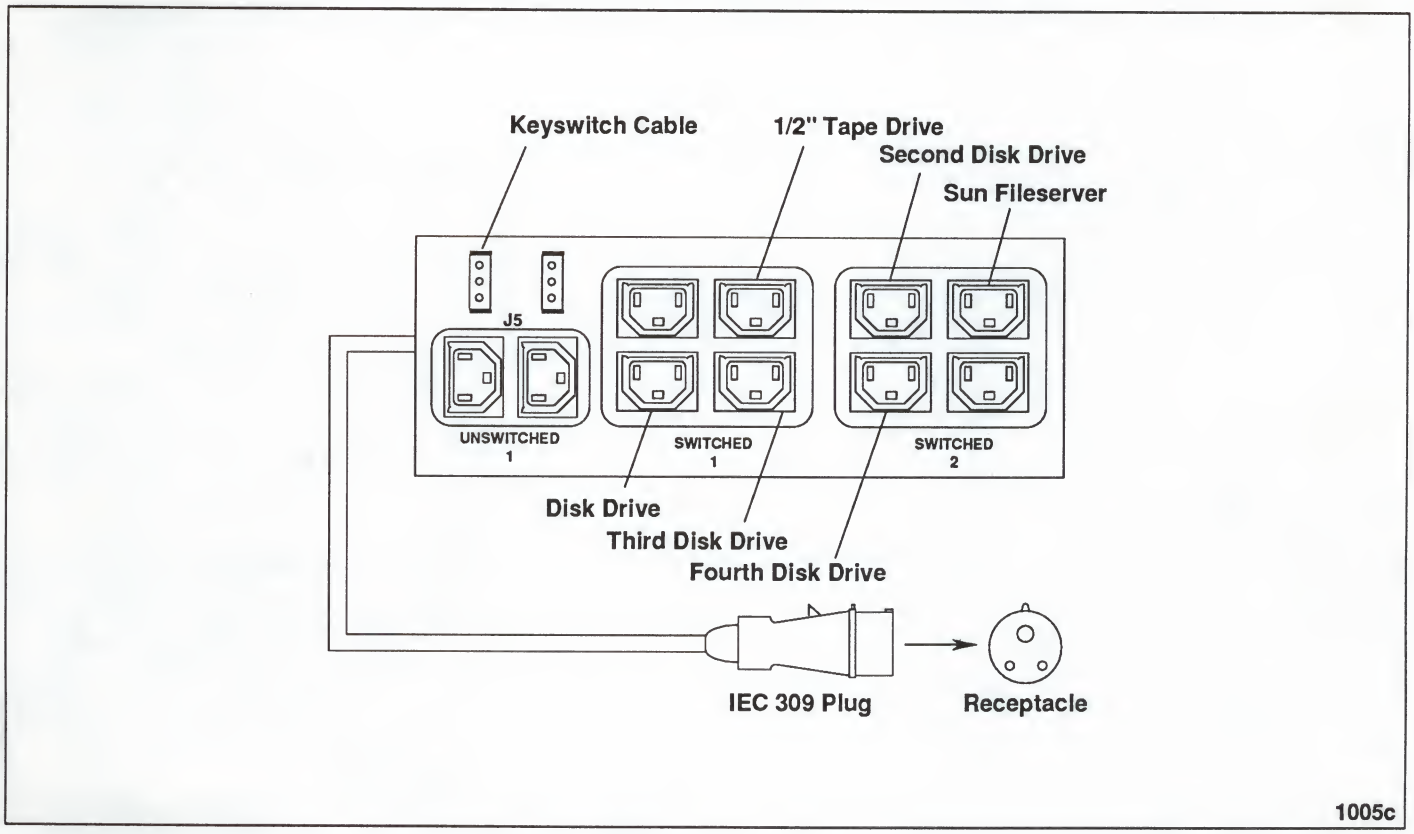
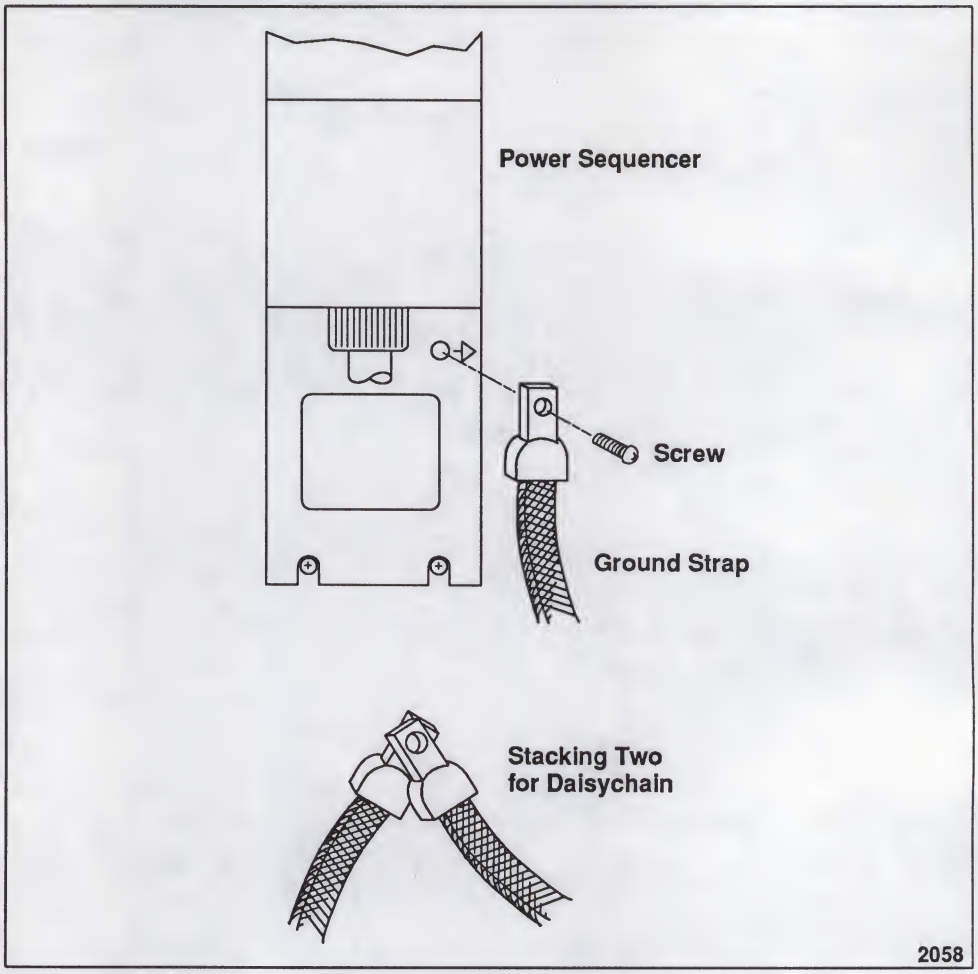


Figure 2-9 *Connecting the Ground Strap*



2.8. After the Installation is Complete

This completes the mechanical portion of the system installation. The system is now ready for software installation; refer to *Installing UNIX on the Sun Workstation*, or *Installing SunOS on the Sun Workstation*, for further instructions. If you will be installing any optional equipment, refer to Chapter 3, ''Installing Options'' of this manual.

3

Installing Options

3

Installing Options

This chapter contains the following information:

- Steps to remove all external panels
- Steps to remove the RFI shield to access the logic enclosure area
- Steps to access the IPI device area
- Steps to access the SCSI Tray for ¼-inch tape expansion
- Steps to access the Front-Load ½-inch Tape area
- Steps to access the ALM-2 panel area

For instructions on accessing the card cage to install a new board or accessing the backplane to reconfigure any jumpers, refer to the *16-Slot Logic Enclosure Installation Manual (P/N 800-3264)*.

WARNING **Access inside the system cabinet is restricted to qualified service personnel, or operators specifically trained by Sun Microsystems to install options in the Sun 56-Inch Data Center Cabinet.**

CAUTION **Improperly installed options will affect system performance and product warranties. This chapter describes access routes to the option areas ONLY. To install options correctly, follow the instructions in the upgrade documentation shipped with the option.**

3.1. Opening the Sun 56-Inch Data Center Cabinet

WARNING **Power off the cabinet and all equipment attached to it or before continuing. Remove the AC power cord from the outlet.**

3.2. Graceful Power-Down

Prior to performing any of the service or maintenance procedures in this chapter, ensure that the system administrator has performed a system backup, and that the workstation is properly powered down. Follow these procedures to properly power down a system:

1. Ensure that you, or the system administrator has warned clients or other workstation users to log out.
2. Log in as super user (root).
3. Synchronize the system disks by typing in the sync command two times as shown below:

   % **#sync** <Return>
   % **#sync** <Return>

4. Follow this with **/etc/halt** or **/etc/fasthalt**, and <Return>. The programs called by these commands ensure that all data in the buffers is written to the disk before the SunOS is halted.
5. When the SunOS is halted, turn system power off and unplug the power cord from the wall receptacle.

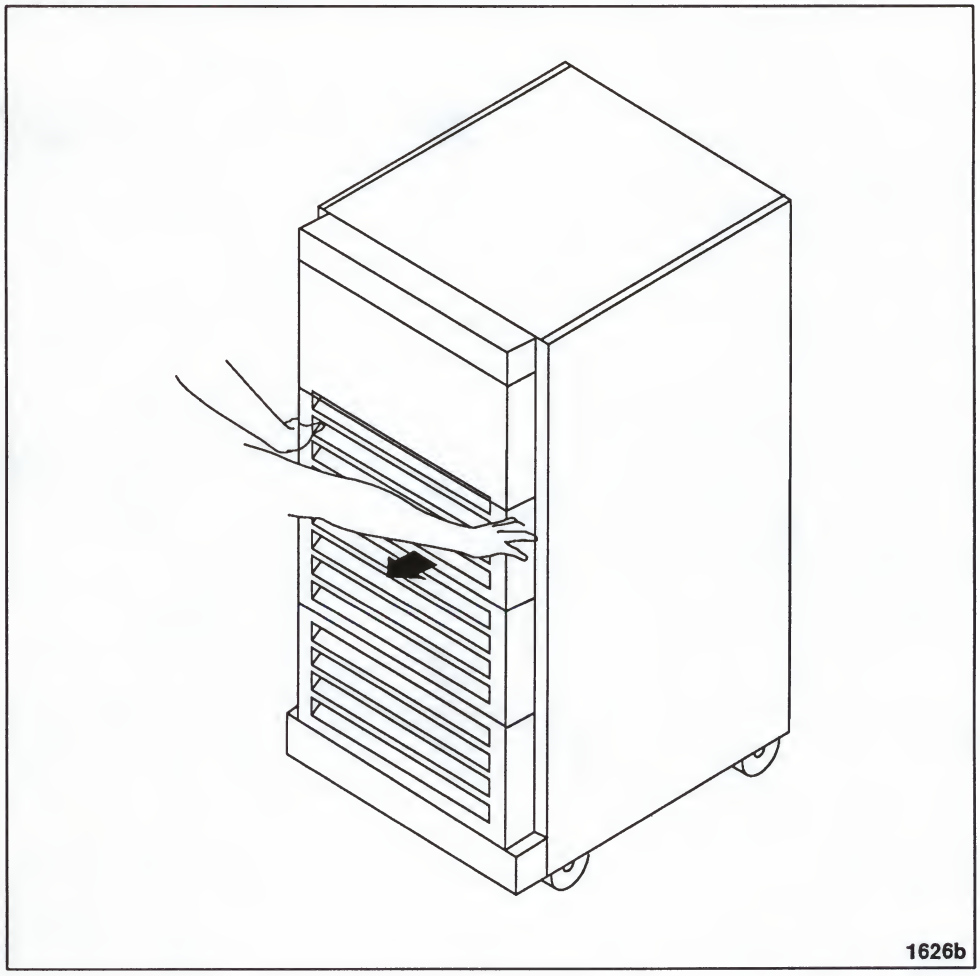
For more information on system administration such as shut-down methods and backups, refer to *System and Network Administration for the Sun Workstation*, P/N 800-1323.

Removing/Replacing the Vented Front Panels

The vented front panels are attached with snap-lock ball studs. The Front-Load ½-Inch Tape Drive panel is hinged on the right side and has a ball stud on the left side (as you stand in front of the cabinet.) It cannot be removed from the system. To remove a standard vented front panel, stand in front of the cabinet and firmly grasp the outer edges of the panel with both hands. Pull the panel toward yourself — it should pull off easily.

To replace a panel, align the two ball stud receptacles on each side of the panel with the two ball studs on the chassis. Press the panel back into place. Figure 3-1 illustrates this procedure.

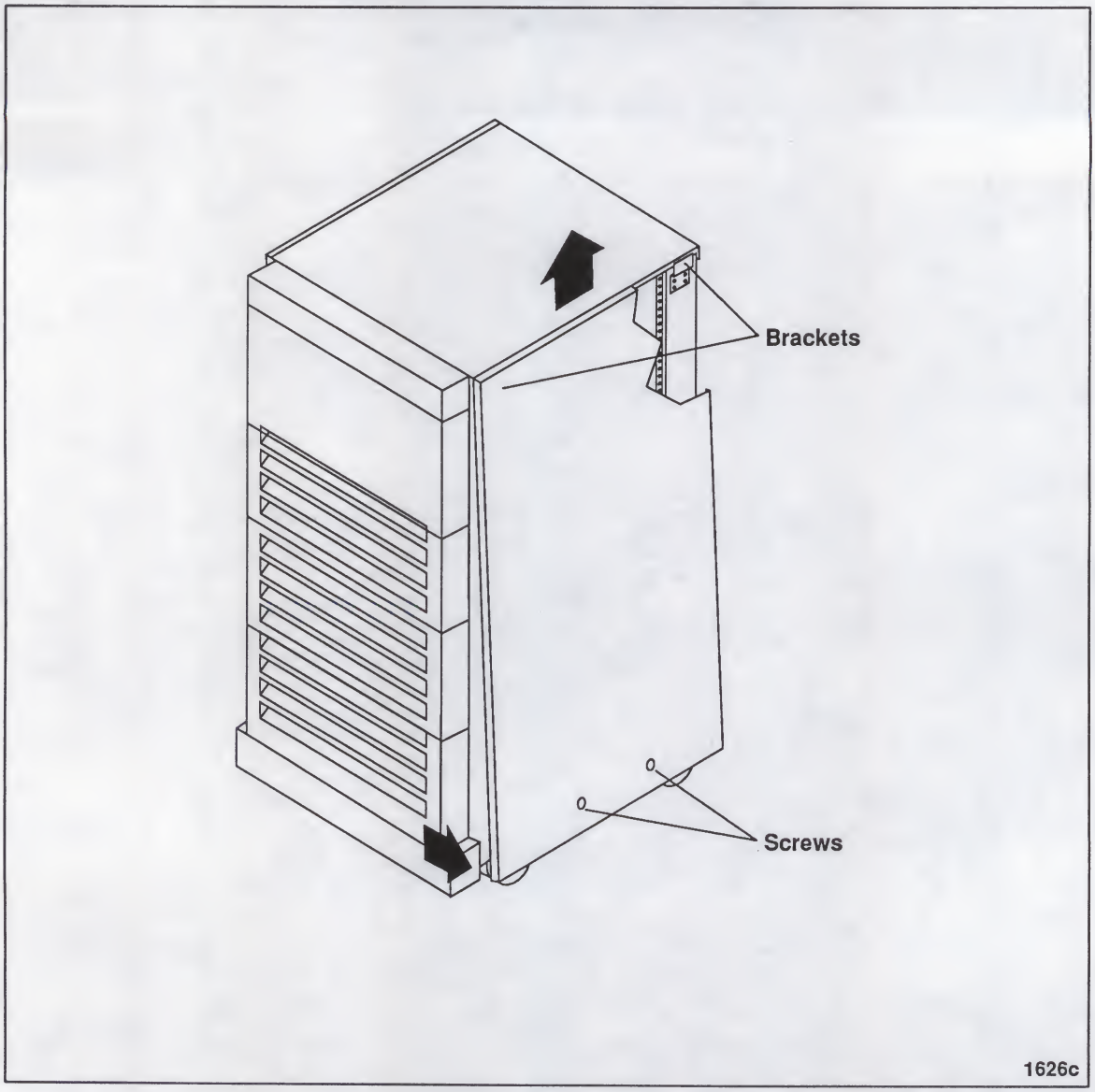
Figure 3-1 *Removing a Front Panel*



Removing/Replacing the Side Panels

Each side panel is attached to the chassis frame with two catches at the top and two captive screws at the bottom. To remove a side panel, use a flat-blade screwdriver to remove the screws. Tilt the bottom out slightly and firmly grasp the outer edges of the panel with both hands. Lift up the panel to release it from the metal catches along the top. Set it aside out of traffic lanes. To replace a side panel, reverse these steps. Figure 3-2 illustrates this procedure.

Figure 3-2 *Removing a Side Panel*

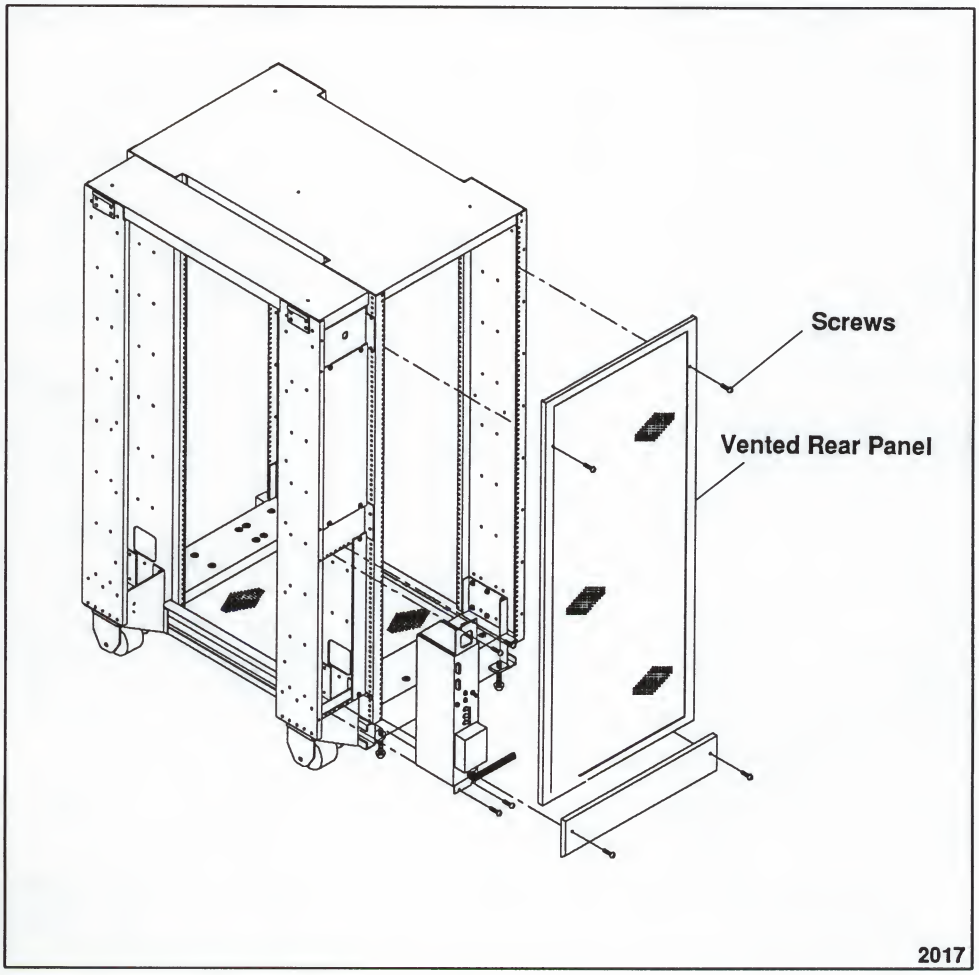


Removing/Replacing the Vented Rear Panel

The vented rear panel is attached with two captive screws. To remove the rear panel, use a Phillips screwdriver to remove the screws. Pull the panel away from the cabinet and set it aside out of traffic lanes. Figure 3-3 illustrates this procedure. To replace the panel, reverse these steps.

NOTE *Always reattach the vented rear panel after removing it. The rear panel helps to control air flow inside the cabinet and to keep foreign objects out of the inside of the cabinet.*

Figure 3-3 *Removing the Vented Rear Panel*

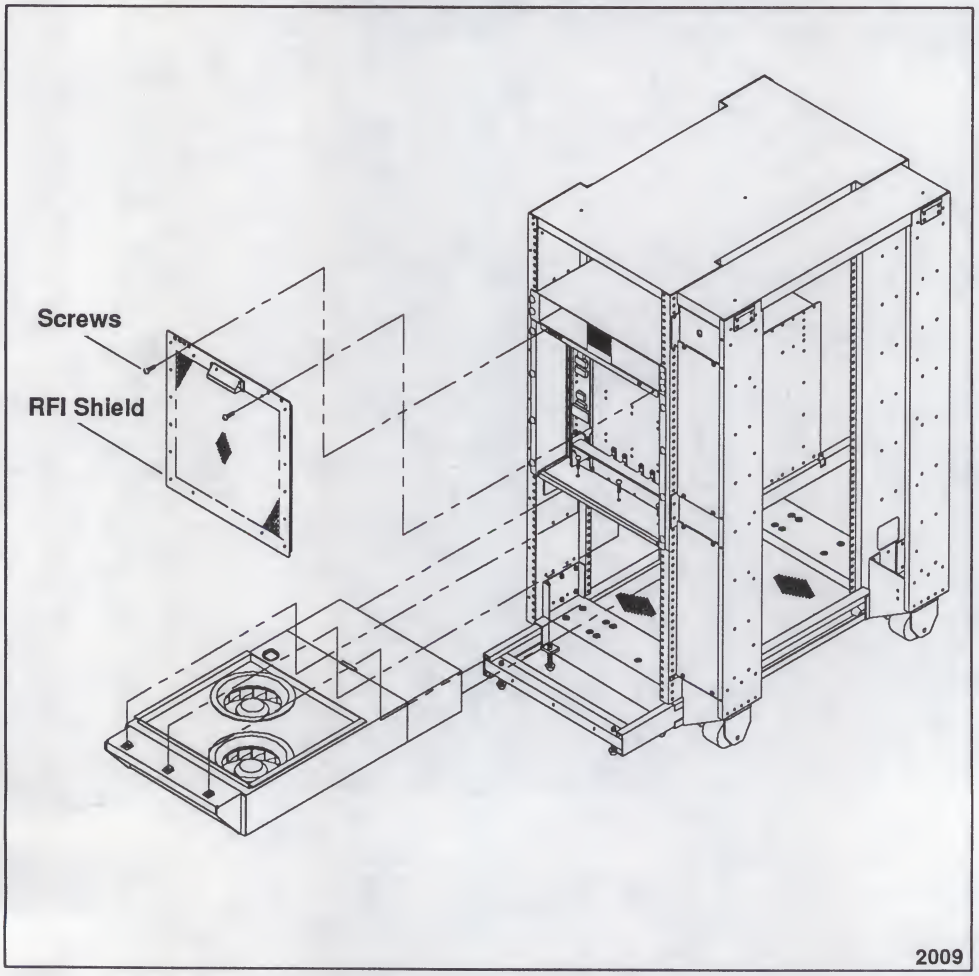


Removing/Replacing the RFI Shield

The radio frequency interference (RFI) shield is attached with two SEM screws along its top edge. Use a Phillips screwdriver to remove the screws and pull the RFI shield away from the logic enclosure (card cage subassembly). Set it aside out of traffic lanes. Figure 3-4 illustrates this procedure. To replace the RFI shield, reverse these steps.

WARNING ***Do not turn power on with the RFI shield removed.***

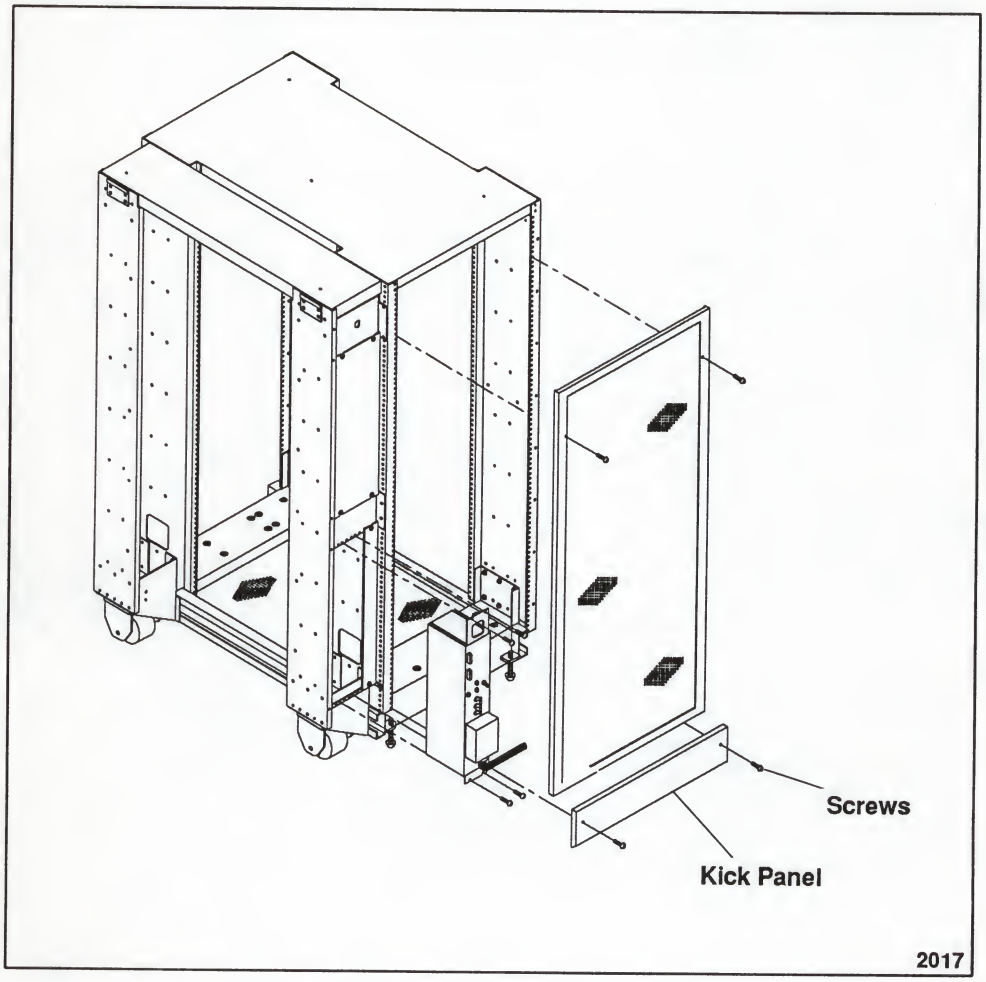
Figure 3-4 *Removing the RFI Shield*



Removing/Replacing the Protective Kick Panel

The small metal panel at the bottom rear of the unit provides extra stability when the cabinet is moved. Some equipment configurations may require additional clearance for cabling. The kick panel is attached with two flat-top screws. Figure 3-5 illustrates this procedure. To remove the kick panel, use a flat-blade screwdriver. Store it for possible future use. To replace a kick panel, reverse these steps.

Figure 3-5 *Removing the Kick Panel*



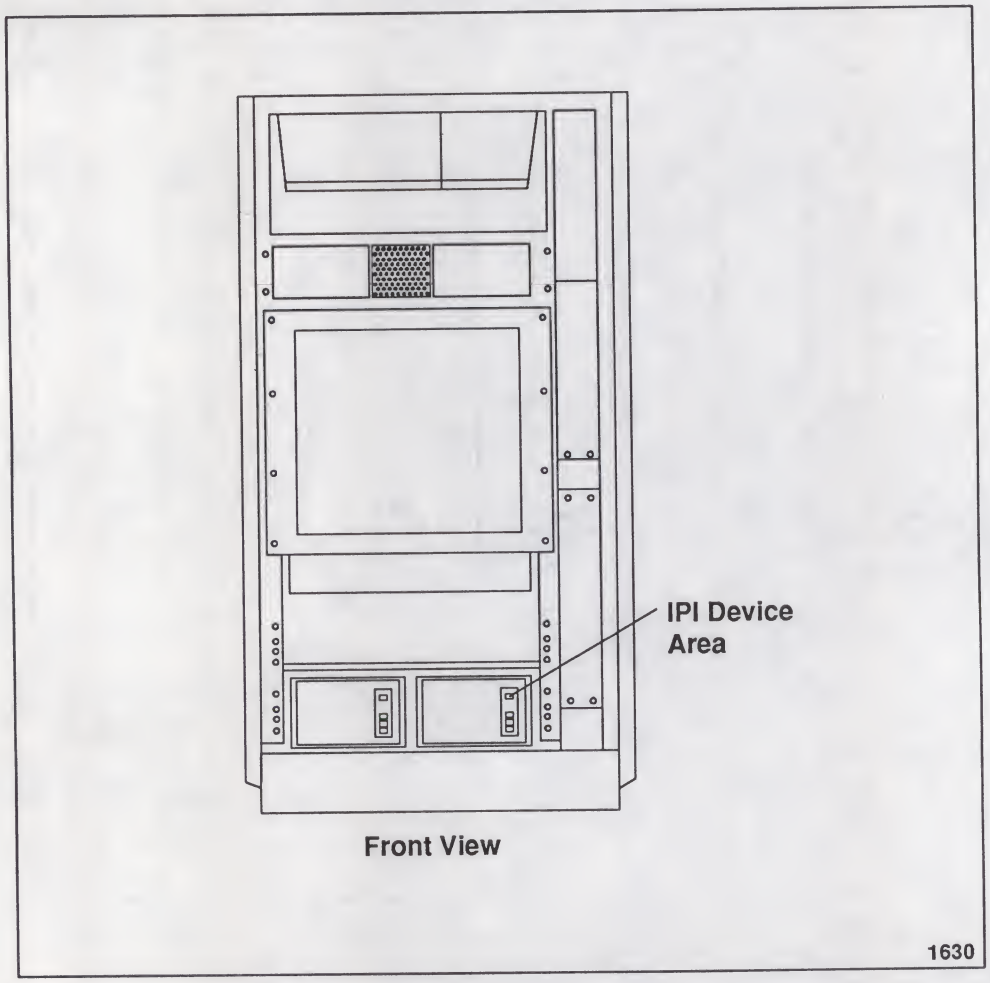
3.3. Accessing the IPI Disk Subsystem Areas

Before adding the IPI device or controller to the cabinet, refer to the appropriate IPI documentation to make sure the drive is an approved option for your system.

Figure 3-6 illustrates how to access the IPI device area. For details on installing interior rails, and installing an IPI tray in the cabinet, refer to the manuals shipped with the IPI device.

For details on installing an additional IPI controller, refer to the installation/configuration manual shipped with the controller.

Figure 3-6 *Accessing the IPI Device Area*



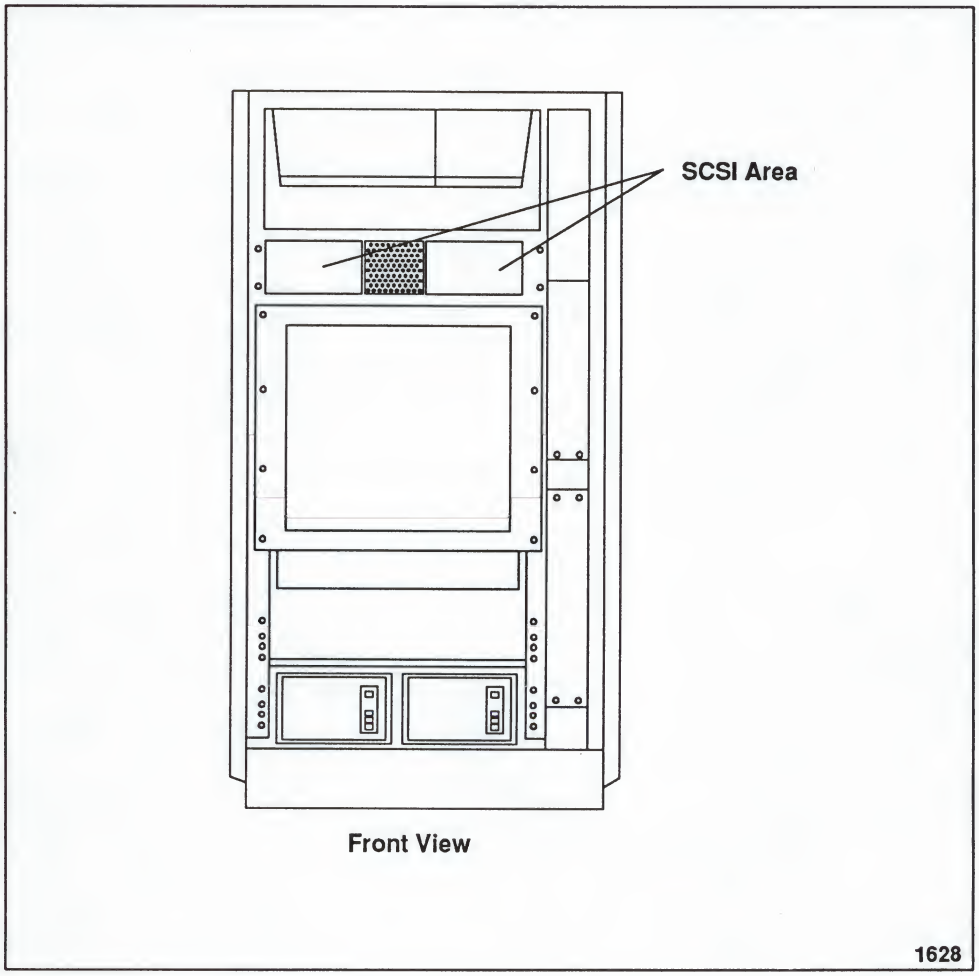
3.4. Accessing the SCSI Tray Area

Before adding another SCSI tape device to the cabinet, refer to the appropriate device documentation to make sure the drive is an approved option for your system. Figure 3-7 illustrates how to access the SCSI area.

For mechanical details of attaching a SCSI device to the SCSI tray refer to the appropriate device installation/configuration manuals.

WARNING ***Follow the directions in the SCSI device installation/configuration manuals on reinstalling the cover plate to the SCSI tray to maintain full RFI compliance.***

Figure 3-7 *Accessing the SCSI Tape Area*



3.5. Accessing the Front-Load ½-Inch Load Tape Area

Before adding another Front-Load ½-Inch Tape Drive to the cabinet, refer to the appropriate front-load tape documentation to make sure that it is an approved option for your system.

The Front-Load ½-inch Tape Drive ships with a replacement front panel. Store the existing front panel in a secure place for possible future requirements.

Figure 3-8 illustrates how to access the Front-Load ½-Inch Tape Drive area.

CAUTION **It takes at least two strong persons to install a Front-Load ½-Inch Tape Drive in the cabinet!**

For mechanical details on how to install the support rails, and connect a Front-Load ½-Inch Tape Drive to the cabinet, refer to the Front-Load ½-Inch Tape Drive installation/configuration manuals.

Figure 3-8 *Accessing the Front-Load Tape Area*

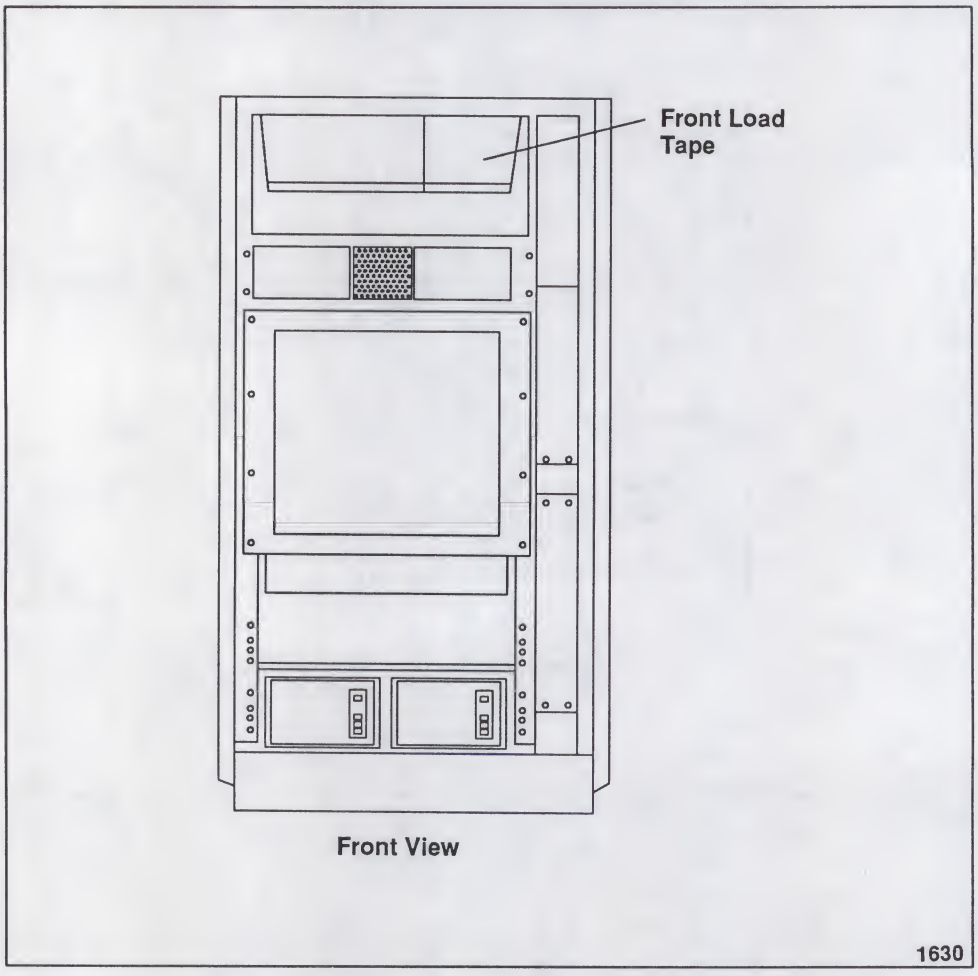
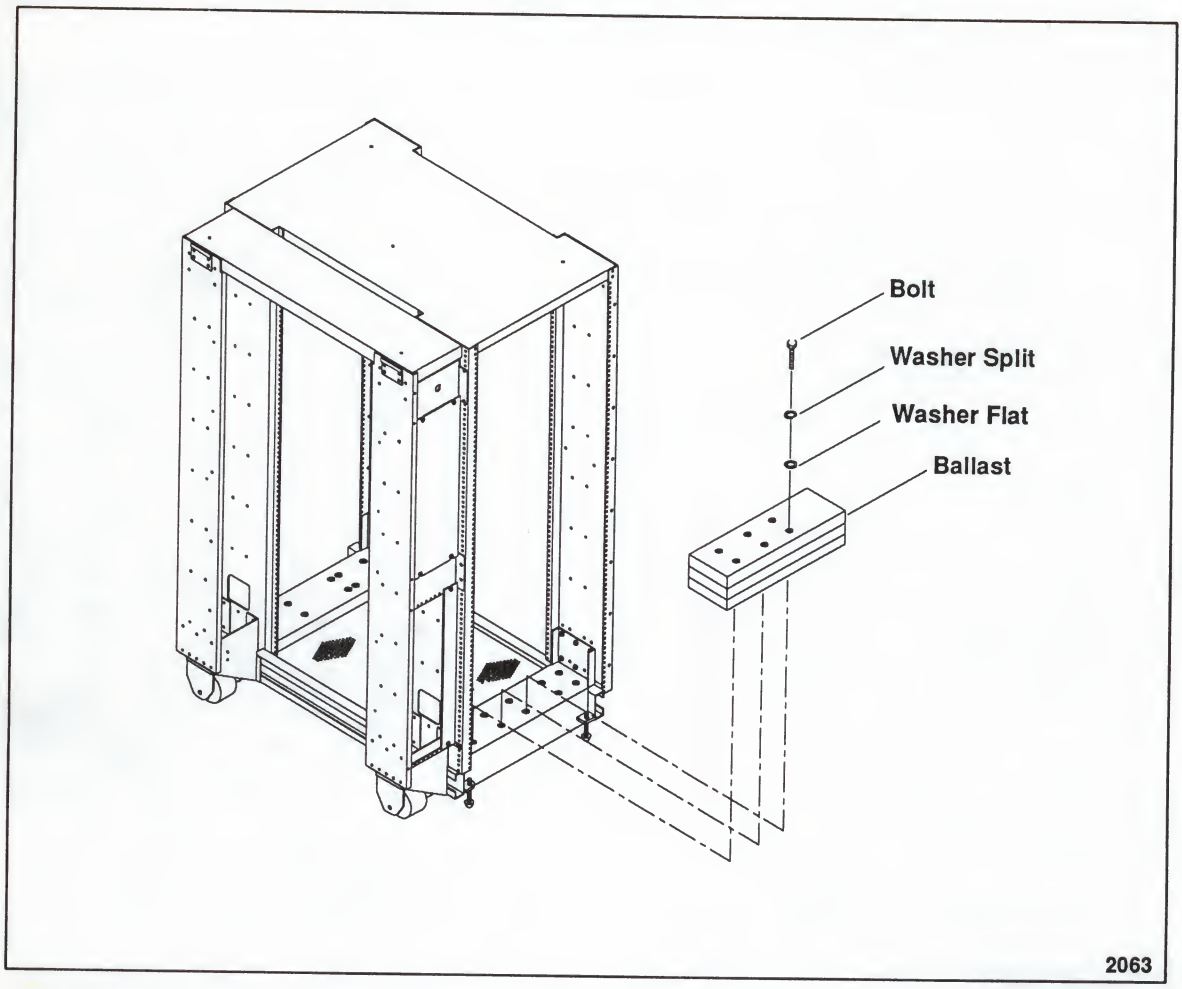


Figure 3-9 *Front-Load Tape Drive Ballast*



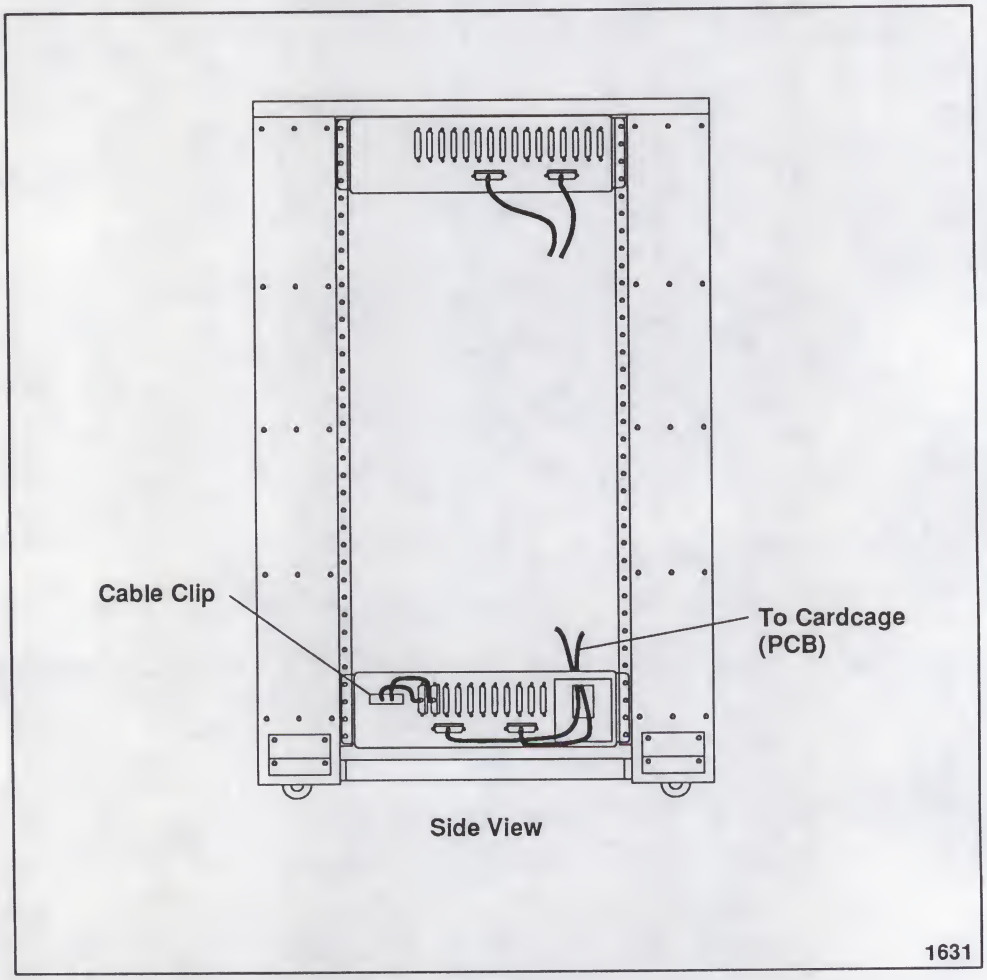
3.6. Accessing the ALM-2 DCA Area

The Asynchronous Line Multiplexer-2 (ALM-2) Device Connector Assembly (DCAs) install inside the left-hand panel. Remove the left panel as described in the "Removing/Replacing the Side Panels" section of this chapter and set it aside.

Figure 3-10 illustrates ALM-2 DCA access inside the Sun 56-Inch Data Center Cabinet.

For the exact mechanical details on how to install the DCA, refer to the *ALM-2 Installation Manual*, P/N 813-1029.

Figure 3-10 *Accessing the ALM-2 DCA Area*



3.7. Accessing the Card Cage and the Backplane Jumpers

Springfingers Caution

CAUTION Springfingers are metal strips that are installed between the edge of the PC board and the outer panel to reduce RFI emissions. Serrated metal "fingers" protrude from either side of the strip.

If a board WITH springfingers is installed next to a board WITHOUT spring fingers, the insulator shield on the outside of the fingers MUST be present to prevent possible shorting of component leads to the spring fingers. Installation of a board WITHOUT springfingers may affect RFI emissions and may therefore affect RFI compliance. Sun Microsystems is not responsible for RFI compliance if non-springfingered boards are added to a system originally shipped WITH springfingers and RFI approval.

In the case of a logic enclosure containing boards WITH or WITHOUT springfingers use the following guidelines:

- Before removing a board WITHOUT springfingers, remove the board to the left if it is equipped WITH springfingers and an outer insulator shield.
- Replace any filler panel equipped WITH springfingers by pulling out the air restrictor panel far enough to allow the springfingers to lay against the panel. Push both units into place simultaneously and fasten with the appropriate fasteners. This procedure makes replacement of the filler panels easier, and reduces the chance of damage to the springfingers.
- Always install a board WITHOUT springfingers first, and then replace the board WITH springfingers and insulator shield in the slot on the left.

If a board with springfingers is installed next to a board or filler panel also equipped with springfingers, the outside insulator shields should be removed.

Ensure that the insulator strip between the inner side of the springfingers and the PC board is intact at all times.

When removing and replacing boards with spring fingers, check the condition of the insulator strip/shield(s) and replace if damaged with P/N 560-1183.

CAUTION **Some of the devices on Sun boards are very sensitive to electrostatic discharge; they can be permanently damaged. An electrostatic charge can build up in the human body and then discharge when you touch the board. *Before handling any board*, make sure that you have placed your hand on a conductive surface that is grounded to a common earth ground, (such as the metal screws on an AC receptacle cover) to discharge the static electricity present in your body.**

CAUTION **To avoid possible personal injury and damage to the system, before proceeding with any disassembly, always shut the system down properly, as described in your *System Administration Manual*.**

Accessing VME Boards

To access a VME board,

1. Remove the rear vented panel as described in Chapter 2.
2. Set the rear panel aside and refer to the *16-Slot Logic Enclosure Installation Manual*, (P/N 800-3264).

Accessing the Backplane Jumpers

To access the backplane jumpers,

1. Remove the center two vented plastic panels as described in Chapter 2.
2. Remove the RFI shield as described in Chapter 2.
3. To change the backplane jumper settings, see the *Card Cage Slot Assignment and Backplane Configuration Procedures* manual for your system.
4. Replace the RFI shield and vented rear panels.

NOTE *If you will be installing additional accessory boards in the system, refer to the documentation that comes with each board for proper installation instructions.*

A

Troubleshooting Faults

A

Troubleshooting Faults

Check the items listed below before calling for service.

A.1. Power Check

- Check the cabinet LEDs— the power indicator should be ON. If not, continue with this subsection.
- Is the fan running? If the fan is not running, make sure the AC power cord is plugged securely into the wall outlet.
- Check and reset the circuit breaker if required.

A.2. Board Check

- Check the seating of the circuit boards. If a board appears to be loose, reseat it as described in the chapter.
- Check the backplane connectors for any bent pins.
- Check the jumper settings on the backplane and accessory boards according to the documentation that comes with the system.

A.3. Drive Check

- For a problem with a disk or tape drive, check the cable seating. A loose connection anywhere in your cabling can cause intermittent problems. Refer to the Chapter 3 directions to access the appropriate drive area. For cabling specifics, refer to the appropriate storage option documentation.
- If a tape unit isn't responding, check the tape cartridge to make sure it is inserted correctly. If the tape is write-protected you won't be able to write to it. Follow all directions on maintaining the tape unit as described in the appropriate storage option documentation.

A.4. External Cable Check

- Power off the system gracefully as described in Chapter 3 before checking external cabling.

A.5. Terminal/Printer Check

- For new printer installations, make sure the printer cable is wired correctly. This is a common cause of printer problems. Refer to the CPU documentation for wiring requirements.
- Check that the terminal or printer is attached to an AC line and powered on. If checking a printer problem, reset the printer.
- Refer to the manufacturer's manual for correct jumper settings and other set up procedures.

- Check that the terminal or printer is configured correctly in the operating system. Make sure printer baud rate and handshaking parameters are correctly configured as described in the operating system documentation.
- To isolate a printer problem, remove the printer temporarily and attach a terminal in its place. Configure the terminal exactly like the printer and try printing to the terminal screen.

A.6. Error Messages

If the troubleshooting steps listed above do not solve the problem, you may refer to the following manuals to interpret error messages.

- *PROM User's Manual*
- *SunDiagnostic Executive User's Guide*

B

Cabling Conventions

B

Cabling Conventions

This appendix illustrates correct routing paths for various types of cabling for the 56-inch Server System Cabinet.

This chapter provides information for the following:

- Keyboard/Mouse
- Ethernet
- Monitors

If you want further information about Ethernet connection, or information about connecting SCSI devices and peripherals to your system, refer to the CPU installation manual. All peripherals are shipped with their own installation manuals as well.

CAUTION **Follow these safety precautions:**

- Do not turn on the cabinet power at any time during the cabling procedure.
- To avoid electric shock and/or a fire hazard, refer all servicing to qualified service personnel.
- Finally, DO NOT plug in the power cord until explicitly instructed to do so.

CAUTION **Before connecting any cables, make certain that:**

- The OFF/ON switch on the cabinet is switched to the OFF position.
- The AC power cord is unplugged from the outlet.

CAUTION **Never connect or disconnect your Keyboard/Mouse cable while the system is powered up.**

B.1. Keyboard and Mouse Connections

The keyboard cable is shipped with the system keyboard. To connect the keyboard and mouse to your system, perform the following procedures:

1. Connect one end of the keyboard cable into the 8-pin DIN connector labeled "KEYBOARD" on the CPU board.
2. Connect the other end of the keyboard cable into one of the connectors located beneath the keyboard. One connector is for the keyboard, and the other is used for the mouse. Either connector may be used.
3. Connect the mouse cable into the unused 8-pin DIN connector on the keyboard.

B.2. Connecting the Ethernet

This section is optional and is only provided for those who need to connect their Data Center Cabinet to Ethernet (using a Sun ETHKIT and appropriate accessories).

Find the Ethernet transceiver cable. It is a thick cable with 15-pin D connectors at both ends.

NOTE *Before continuing this procedure, make certain that the CPU board installed in your unit is properly set for the type of Ethernet transceiver you want to use. The board is set at the factory to run a Level 2 Ethernet transceiver. If you are using a Level 1 Ethernet transceiver, consult the board installation document included with your shipment for Ethernet level selection procedures. All transceivers currently sold by Sun Microsystems operate properly with a Level 2 Ethernet setting; therefore, no level adjustment is necessary. Examples of transceiver types are listed in the following paragraphs.*

Level 1 transceivers include the TCL 2010E, 3COM 3C100, DEC H4000, and Interlan NT10.

Level 2 transceivers include the TCL 2010I, 3COM 3C101, 3C102, 3C106, 3C107, 3C108, 3C109, and BICC 1110.

Note that multiplexer boxes, such as Digital Equipment Corporation's DELNI, require a transceiver when used with the Ethernet applications given in the following pages.

NOTE *While these transceivers are compatible with Sun equipment, it should be understood that Sun Microsystems does not guarantee the performance of any component not purchased from Sun.*

Connecting the Ethernet Transceiver Cable

1. After locating the Ethernet transceiver (drop) cable, find the end with the male 15-pin D connector. The male end of the Ethernet cable has a pair of metal studs that fit into the slide lock assembly attached to the CPU board's "ETHERNET" jack. Connect this male end into the "ETHERNET" jack. Push the slide lock over the studs to fasten the male D connector securely in place.
2. The female end of the cable has the slide lock assembly attached to it. Connect this end into the Ethernet transceiver and lock it securely.

If you ordered an Ethernet kit, you have received a 15-meter transceiver cable and either "vampire tap" or "N" type connectors (see the following figures). The coaxial cable and terminators necessary to connect multiple systems to a network may be purchased separately from Sun.

Guidelines for Setting up the Ethernet

Guidelines for setting up Ethernet using Sun-supplied or third-party components are covered in this subsection. Read all manufacturer instructions and the following directions to obtain best results. Sun Microsystems does not guarantee the performance of any part not purchased from Sun.

NOTE *If you have not already done so, refer to the CPU board installation document included with your system for information on properly setting the jumper that determines the Ethernet transceiver operating level. An incompatible operating level may cause Ethernet malfunction.*

1. Screw the 50-ohm coaxial cable into one of the transceiver N connectors (an N connector is a round screw-on connector). If you are using a coaxial active tap connector (also known as a "vampire"), attach it to the coaxial cable using the instructions included with the transceiver kit.
2. The coaxial cable may continue out the opposite end of the N or "vampire" connector, or it may have a 50-ohm terminator attached. The cable may be terminated by attaching the 50-ohm terminator to one of the following:
   a. The transceiver's vacant N connector.
   b. The end of the coaxial cable using a "female" double N (barrel) connector (if available).

CAUTION **Since the coaxial cable is fragile, handle it carefully. Do not install it in an area where it may be run over or stepped on.**

3. For each system, plug the female end of the system's transceiver cable into the 15-pin D connector on the transceiver. Then plug the male end of the system's transceiver cable into the "ETHERNET" connector on the CPU board's rear edge.
4. Finally, ensure that the level select jumper on the CPU board has been set for either a Level 1 or Level 2 Ethernet transceiver (as previously mentioned). Refer to figures B-1 or B-2.

Figure B-1 *Linking Up to a Sun Level "1" Type Ethernet Transceiver*

Key	*Description*
1	Terminator
2	Female N connector to transceiver
3	Male N connector to transceiver
4	Ethernet transceiver D connector
5	Sun system to Ethernet D connector

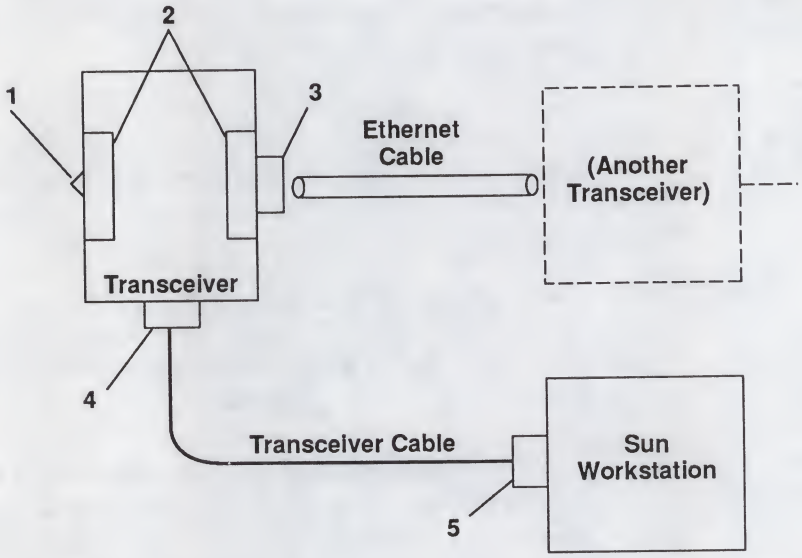
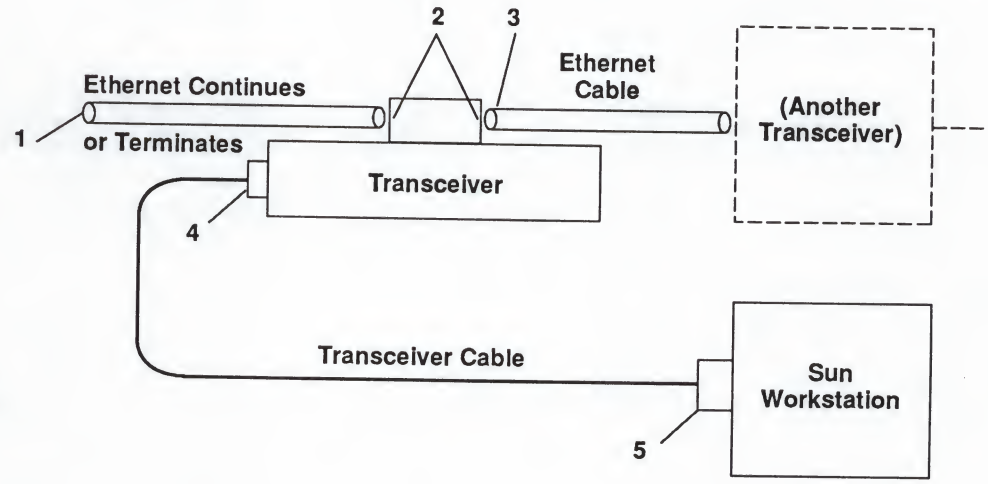


Figure B-2 *Linking Up to a Sun Level "2" Type Ethernet Transceiver*

Key	*Description*
1	Continuing Cable or Terminator
2	Female N connector to transceiver or vampire
3	Male N connector to transceiver or vampire
4	Ethernet transceiver D connector
5	Sun system to Ethernet D connector



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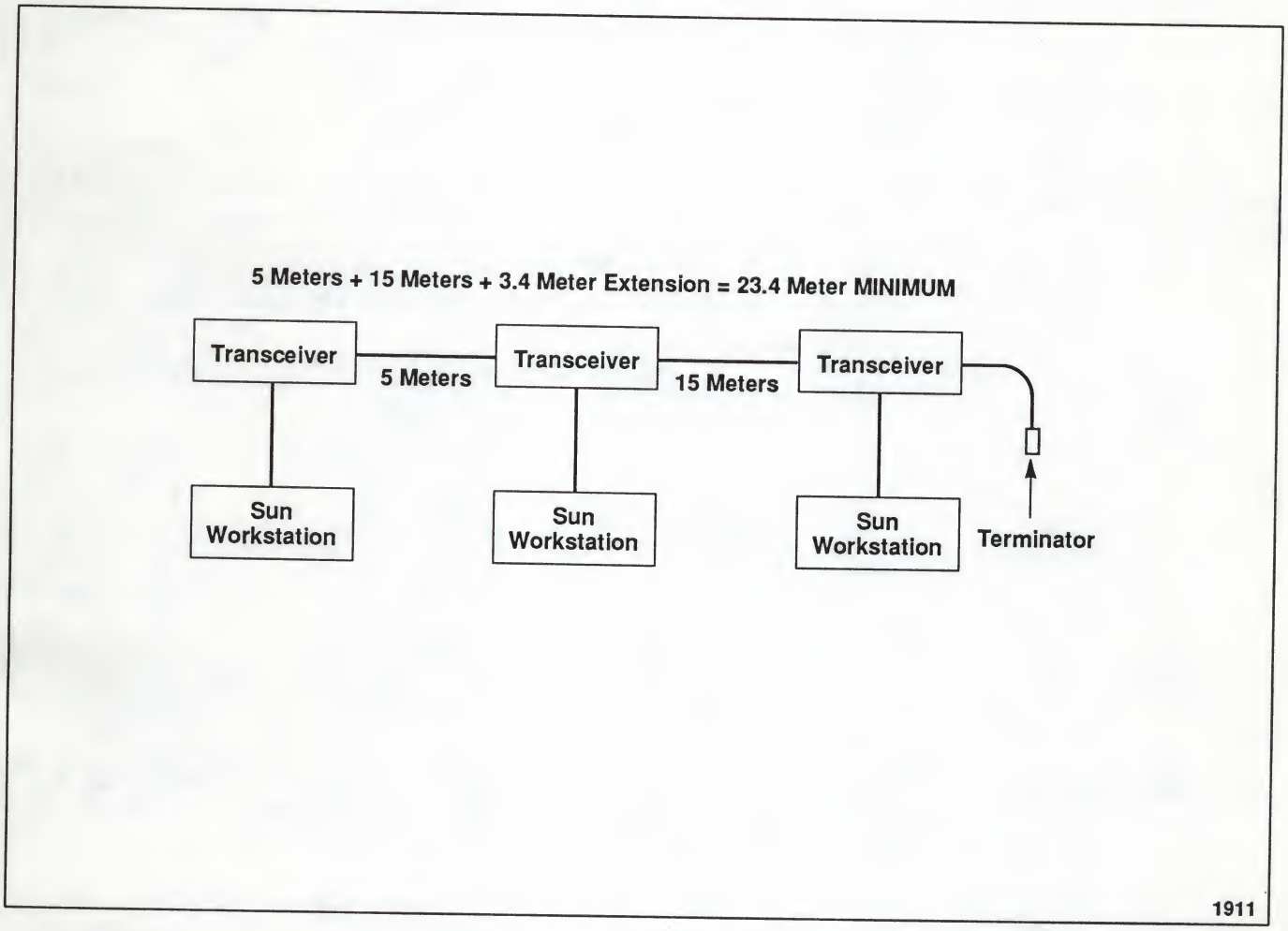
Please note that there are certain cabling limitations that must be observed for proper Ethernet implementation:

Table B-1 *Ethernet Cabling Limitations*

MAXIMUM contiguous length of coaxial cable segments	500.0 meters
Distance between transceivers*	2.5 meter multiples*
MINIMUM length of Ethernet coaxial cable segments	23.4 meters
MAXIMUM length of transceiver ''drop'' cable	50.0 meters

*Transceivers must be placed at **intervals** along the Ethernet cable of 2.5 meters (or some multiple of 2.5 meters). That is, you could connect transceivers 2.5 meters apart, but not 2.0 meters apart. Or, you could connect transceivers 15 meters apart (6 times 2.5 meters), but not 14.0 meters apart (see figure B-3 that follows).

Figure B-3 *Ethernet Cabling Lengths*



The female N connector on the transceiver connects to the male N connector on the Ethernet cable. For optimum Ethernet operation, total lengths of Ethernet coaxial cable should be either 23.4, 70.2, 117.0 or 500 meters. If your cable network falls short of one of these milestones, you may add additional coaxial cable and a terminator. This is illustrated in the previous figure where an additional length of coax cable and a terminator have been added to make this small Ethernet total 23.4 meters.

All Ethernet cable you use should be marked every 2.5 meters. Make certain you attach each transceiver on a mark.

B.3. Monitor Connection

Your 56-Inch Data Center Cabinet may come equipped to use a standard monochrome monitor or a color monitor. If you have a monitor type that is not described in this section, instructions for connecting it are provided with the monitor.

CAUTION **Before beginning the following connections, make certain that the AC power switch on the monitor is OFF ("O" pushed in).**

NOTE *The unit is designed to conform with the West German ergonomics standard ZH1/618. An anti-glare screen on the monitor (such as OCLI filter) is required to comply with this standard. For test processing, a positive mode display (black characters on a white background) is recommended.*

Connecting a Monochrome Monitor

If you have a monochrome (black and white) monitor, you should connect it to the video connector on the rear edge of the frame buffer board. Your frame buffer board installation manual has detailed information on its location.

1. Find the monochrome monitor's video cable. The monitor's video cable has a 9-pin D connector at each end.

a. Connect the male D connector of the video cable into the "VIDEO" jack on the rear of the cabinet and tighten the screws.

b. Connect the female D connector of the video cable into the "VIDEO" input of the monitor and tighten the screws.

2. Find the monitor power cable.

a. Connect the female end into the power receptacle on the rear of the monitor.

b. Connect the male end into the AC wall receptacle.

c. Refer to the next chapter for powering on your monitor.

Connecting a Color Monitor

Your Sun 56-Inch Data Center Cabinet may come equipped with a board that allows use of a color monitor. Four cables (bundled together as one) attach the video connectors at the rear of the system to the color monitor.

NOTE Regardless of whether your color monitor has its connectors lined up in a horizontal or vertical order, you should follow the procedures for connecting the monitor as outlined below. Refer to figure B-4

1. Twist the cable with the red marker into the female connector marked "RED" on the rear edge of the Sun video board. Connect the other end of this cable into the similar connector marked "RED" on the rear of the color monitor.

2. Twist the cable with the green marker into the female connector marked "GREEN" on the rear edge of the Sun video board. Connect the other end of this cable into the similar connector marked "GREEN" on the rear of the color monitor.

3. Twist the cable with the blue marker into the female connector marked "BLUE" on the rear edge of the Sun video board. Connect the other end of this cable into the similar connector marked "BLUE" on the rear of the color monitor.

4. Twist the remaining cable (no color code) into the female connector marked "SYNC" on the rear edge of the Sun color board. Connect the other end of this cable into the similar connector marked "SYNC" on the rear of the color monitor.

NOTE *The Sun-3 color boards (P/N 501-1116) have an additional connector at the top that has no "monitor related" function. Do not attach any of the cables to the top connector.*

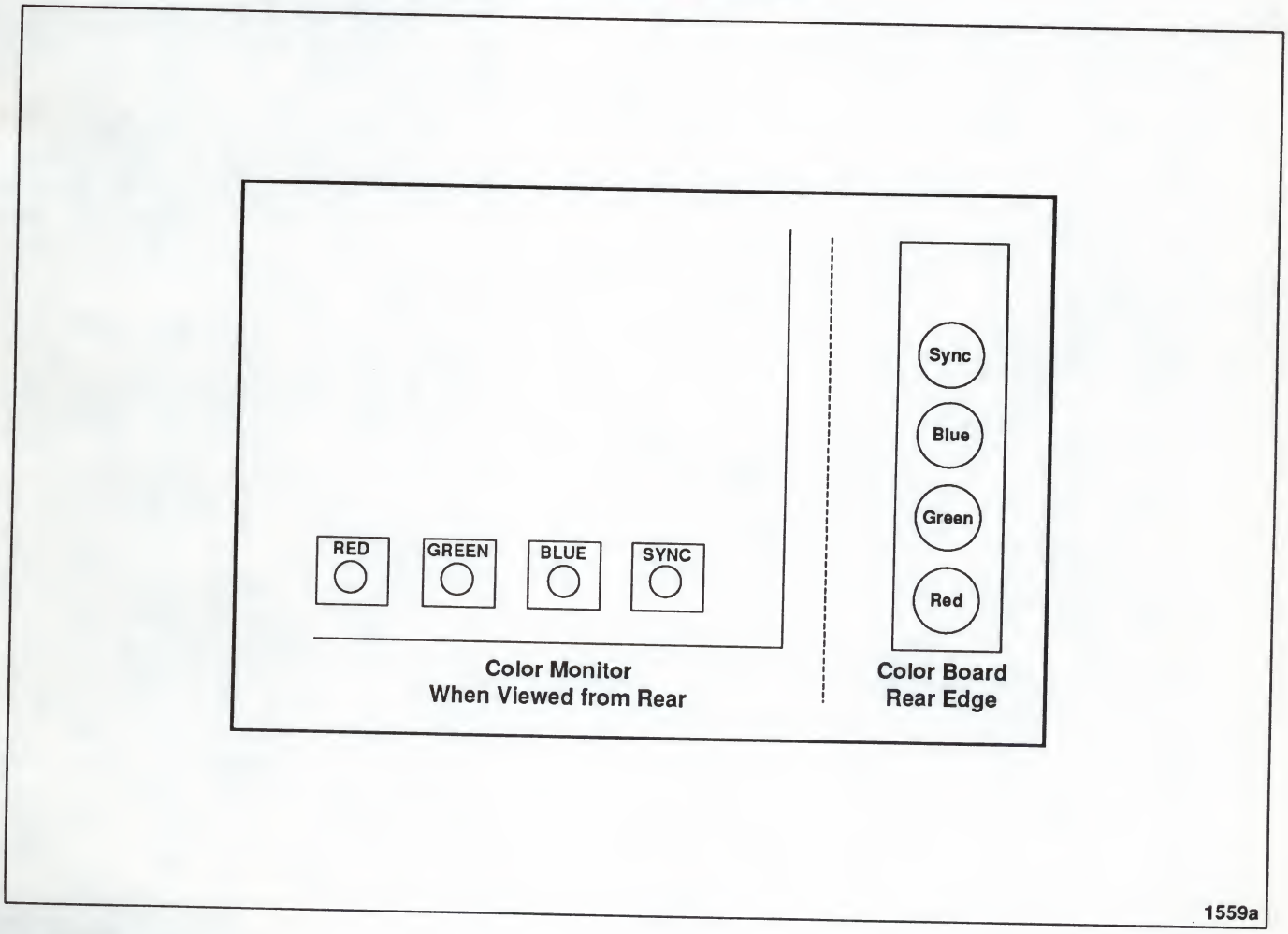
5. Finally, if your color monitor has impedance switches on the back of the monitor (marked "75Ω/High"), make sure they are set to the "75Ω" position.

6. Find the monitor power cable.

a. Connect the female end into the power receptacle on the rear of the monitor.

b. Connect the male end into the AC wall receptacle. Refer to figure B-4.

Figure B-4 *Color and Sync Connection Example*



Revision History

Dash Number	*Revision*	*Date*	*Comments*
10	A	26 September 1989	First Customer Shipment

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Revision A of 26 September 1989

SUN 56-INCH CABINET INSTALLATION MANUAL READER COMMENT SHEET —

Content

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